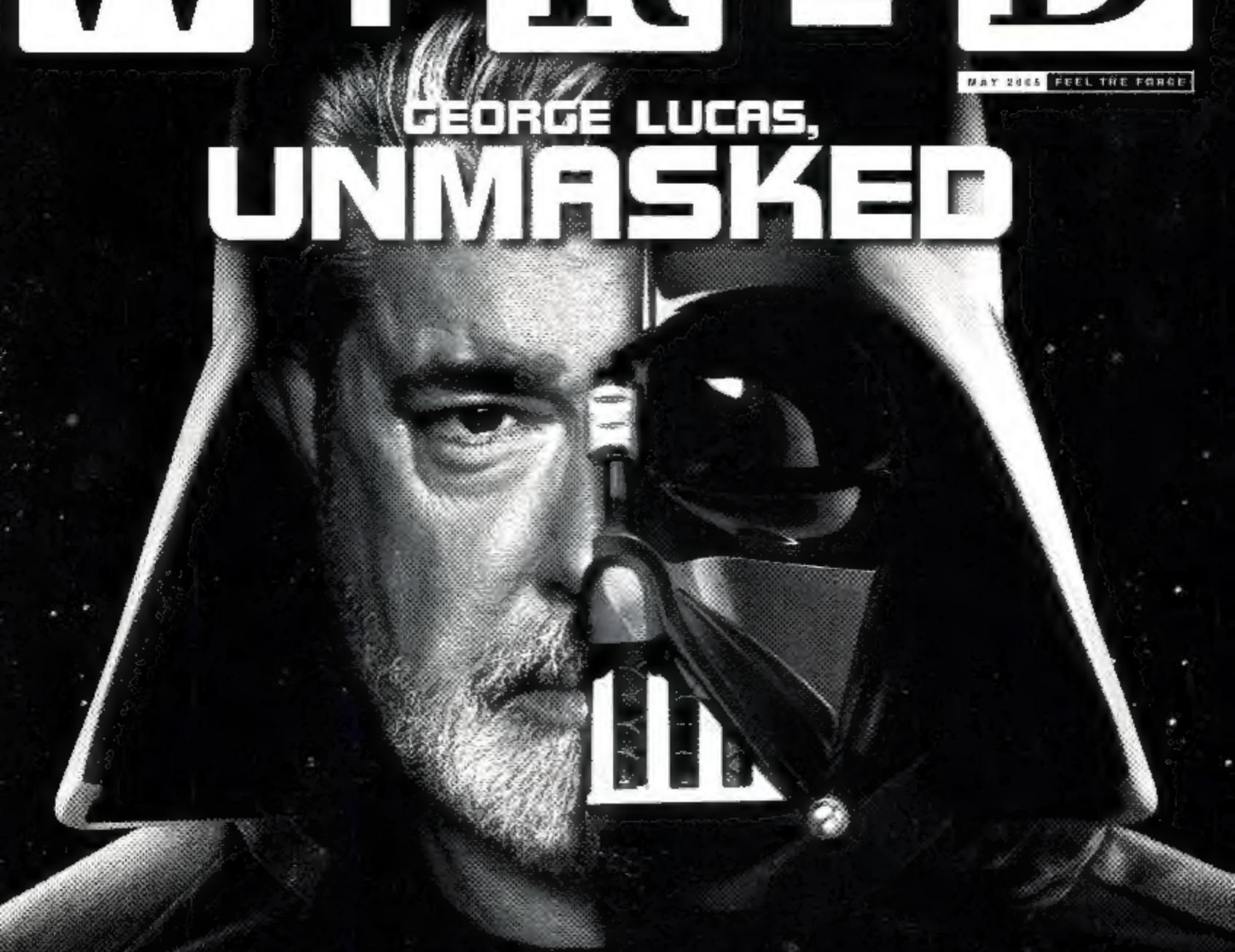


WIRED

MAY 2005 FEEL THE FORCE

GEORGE LUCAS, UNMASKED



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•• Inside the New Lucas Film & Game Factory ••
•• The Wired Guide to How Star Wars Changed the World ••

GET SMART: WHY I.Q. IS SKYROCKETING
THE RISE OF SOLAR ENERGY (NO KIDDING)
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THE WIRED 40: Companies Driving
the Global Economy - Google, Apple,
eBay, Nokia ... Plus: Samsung vs. Sony

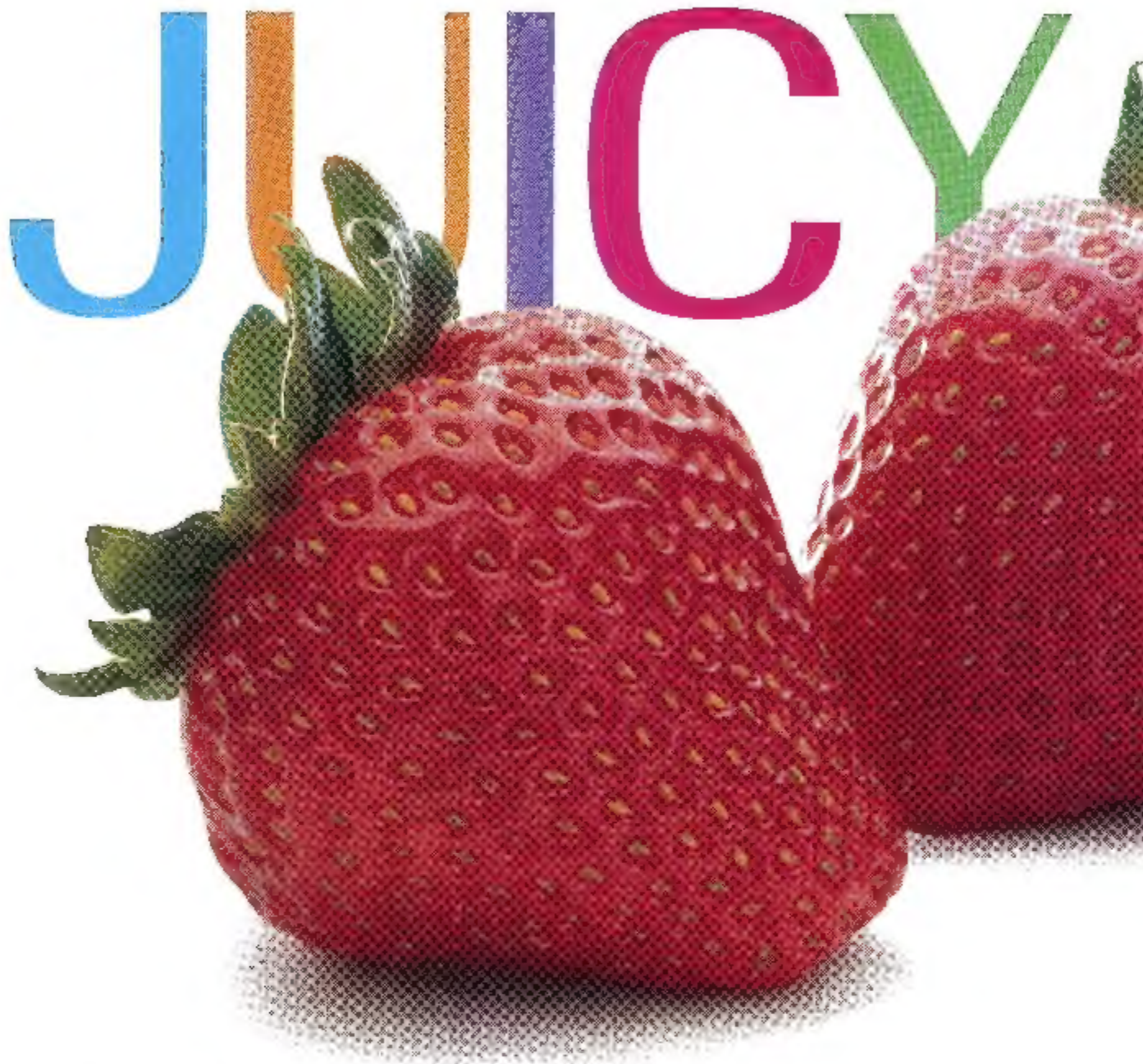


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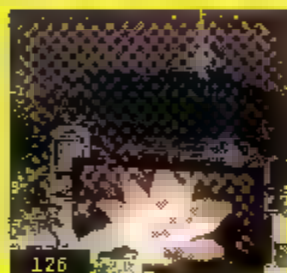


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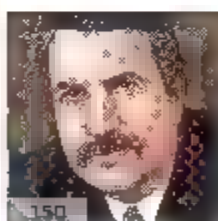
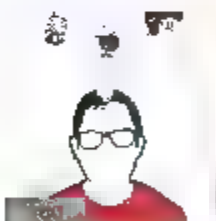
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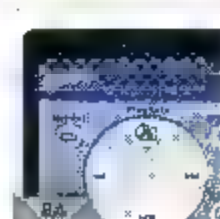
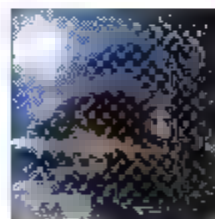
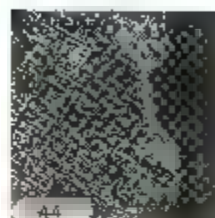
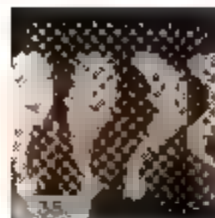
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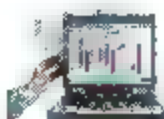
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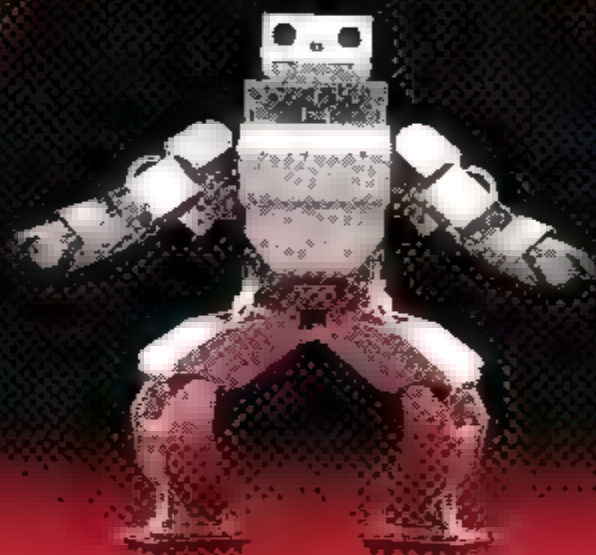
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"The *Wired* 40 captures everything that's interesting in business and innovation," says **Michael Sauter**, who spearheaded our eighth annual roundup of tech's most daring enterprises (page 10). Narrowing it down is the hard part. Six firms got bumped, "is yet to make room for newcomers like *we Blue*. These companies are changing the way we live," McDonald says. By definition, there's going to be some attrition."



"Celebrities are a lower level 'regular poopie,'" says photographer **Barry Scheraga**. So don't treat them any differently. Which means regular folks—like the rising number of trains' bar, *Artie's*, who generate their own electricity (page 58)—get the star treatment. "I really like the people we see for this story," says Schmidt, who grew up in a village near Marburg, Germany, before heading for the bright lights of New York.



Contributing editor **STEVEN JOHNSON** fired a shot about James Flynn's controversial ideas on increasing intelligence years ago. "This philosophical process stumbled into a marbled debate on IQ testing," Johnson says. While writing his new book, *Everything Bad Is Good for You*, Johnson ran across Flynn again—and decided to look into why IQ scores are climbing in the supposedly dumbed-down age (page 60).



Research ed for **JOANNA PEARSTEIN** oversees *Wired*'s architecture and hardware, and many of the magazine's photographs. But she gets a real kick out of sitting through the rents and raves we receive from readers (page 27). "Publishing a magazine is like facing a grand jury each month," says Pearstein, who has written about tech for *The New York Times* and *Red Herring*. Lucky for us, they find our avon a lot more like

PHOTOGRAPHY: JEFFREY M. HARRIS; STYLING: JENNIFER K. HARRIS

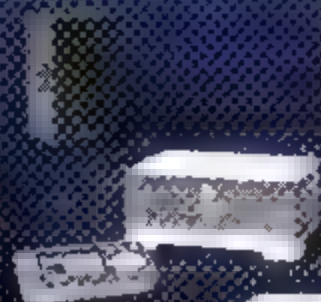
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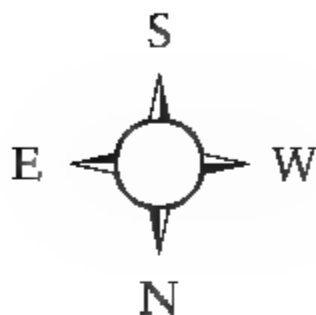
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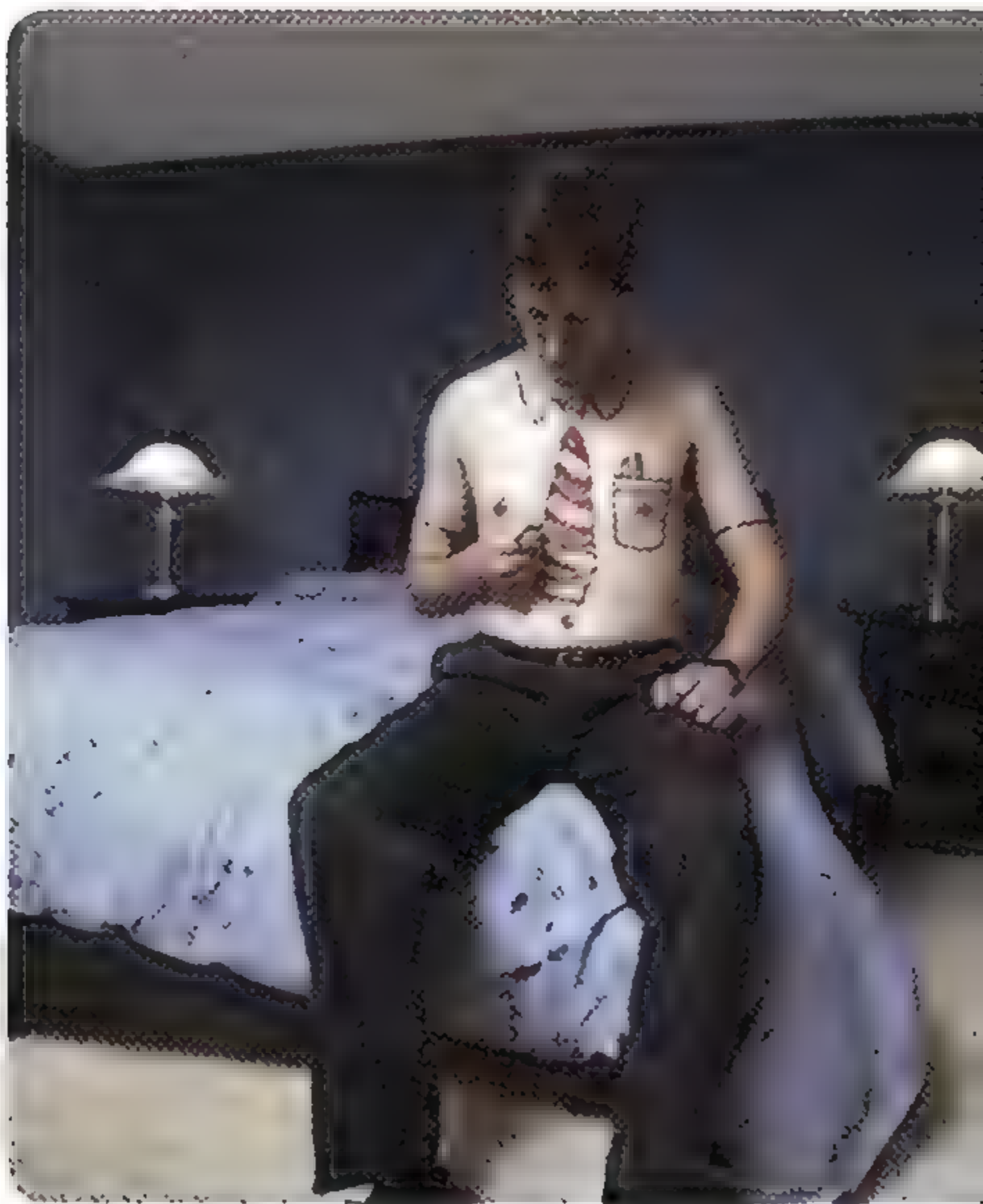


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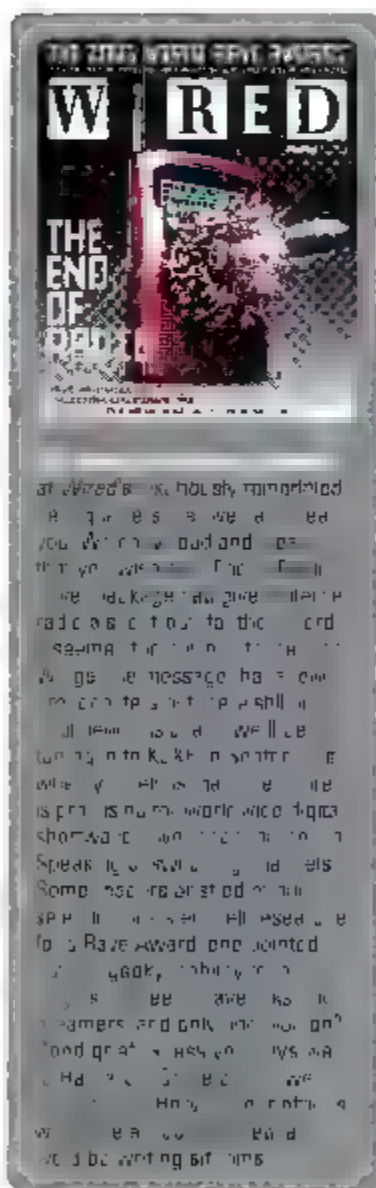
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"SATELLITE RADIO WILL CAUSE REGULAR RADIO TO CHANGE, NOT DIE OFF!"



A Trip Across the Dial

I enjoyed "The Resurrection of Indie Radio" (issue 13.03). Most articles of this type hysterically pronounce the end of the media form in question. But no new media in history has ever eliminated the older media type. Newspapers survived the invention of the radio, just as radio survived the advent of television. Cable TV has not eliminated network TV, unfortunately, and the Internet still hasn't killed off all forms of print. All media is adaptive, and satellite radio will cause regular radio to change but not die off. Only radio companies that stick their heads in the sand and ignore satellite radio will be gone.

Scott Speer

Bozeman, Washington

I am 61 and can remember the day, about 40 years ago, that I turned off the radio when a DJ started to advertise the prices of produce at a local supermarket. Your articles piqued my interest. I may turn the radio back on to hear what's happening.

Lynn Ellsworth

Phoenix, Arizona

The articles attesting to a different paradigm for radio barely scratched the surface. It's not just about satellite radio; it's about the hundreds of stations all over the globe that are streaming over the Internet. KCRW in Santa Monica is but one example. Radio's future is bright, as new delivery technologies will certainly challenge today's mode of how listeners pick and choose content, and from what sources.

John D. Dornier

Raleigh, North Carolina

Stern Warning

Ana Marie Cox's "Howard Stern and the Satellite Wars" (issue 13.03) attributes Stern's success to the FCC's mid-1990s deregulation, which allowed the radio industry to consolidate around the most popular hosts. Saying that Stern owes his popular-

ity to the government's refraining from controlling the free market is akin to attributing a pedestrian's health to the vehicles that don't run him over.

Despite the indecency laws that violate the First Amendment, the free market is ultimately the only judge capable of allocating broadcasting spectrum according to the needs of the public. Stern's success may have been jump-started by his verberating-do, but from now on he will be judged solely by the FCC. Regardless, Stern provides

Leslie Perlmutter

Brooklyn, New York

The UnGoogles

You guys are bad. Comparing Yahoo! to Google ("Yahoo! The Invisible Giant Turns 10," issue 13.03) is like comparing Ford to Pepsi. Yahoo! is a destination site, and Google is a search engine. If you compared the traffic from the Yahoo! search engine to Google, that would be fair. Even your financial figures were deceptive: you didn't mention how much more traffic Yahoo! Google is running. Consider revenue per employee: Google is \$14 million compared with a mere \$650,000 at Yahoo! Profit per employee is improved for Yahoo!, but Google is still better.

Doug Allen

San Francisco, California

Thanks for the Yahoo! article. I'm weary of Google's darling status, given how little it does to combat click fraud and suppression of spam, and given that it does almost nothing to help the honest advertisers hurt by the fraud. Google's "who cares what you think" attitude about the new AdSense feature is the most recent example of obnoxiousness. Give me Yahoo!; it doesn't pretend to be altruistic and is far less evil.

Rick L. P.

Waltham, Massachusetts



The All-New Nissan Pathfinder



SHIFT adventure

"Giant Raccoon Not Included."
by Chad Jernett.



The Wikipedia Way

Dan H. Pink's article on Wikipedia "The Book Stops Here," issue 13.03) struck a reasonable balance. My only concern was the suggestion that "guardians of the knowledge cathedrals" librarians, encyclopedists, academics" object to Wikipedia's methods. I think the majority of librarians welcome Wikipedia and see it as a valuable resource, not perfect, but another tool in our arsenal. Peter Schoenheit, Manager, virtual services, Edmonton Public Library, Edmonton, Alberta

I was disappointed that the article about Wikipedia did not mention the *Oxford English Dictionary*, which would not have been created without the help of hundreds of volunteers in England and the U.S. The OED was created using a collaborative model similar to the one Pink claims was brought forth by Wikipedia creator Jimmy Wales. Wales should be praised for starting a great service, but those interested in Wikipedia should read Simon Winchester's books about how the OED was created almost 150 years ago. Arlo Lyle, Tulsa, Oklahoma

Flush With Knowledge

Just finished the piece about the toilet of tomorrow "The King of Thrones," issue 13.03) which I read in the "un, library" and I just wanted to say Holy crap, Danie McGinn managed to make plumbing interesting. Consider this a fan letter or perhaps a hit-the-target letter. Fawn Fitter, San Francisco, California

Embarrassingly Bad Broadband

Lawrence Lessig seems to want to improve service and pricing in broadband internet access. "Why Your Broadband Sucks" view, issue 13.03 OK. But he has failed to learn the lesson of the Soviet Union, and that of cable TV. Before there was competition from satellites, cable companies

enjoyed monopoly control of their markets. Would Lessig's solution of free municipal cable TV have improved service or pricing? Against free service, even the old cable outfits couldn't have competed, to say nothing of the untrod satellite companies. More likely, we would have seen another monopoly, except that we would have had to pay for a service that we didn't want. With no competitive pressure, the price could grow uncontrollably. Harvey Hartman, Santa Cruz, California

As embarrassed as Lessig is about the U.S. ranking 33rd in broadband, isn't it more embarrassing that U.S. high school students ranked 24th in math literacy last year? Comparing city-provided water (a real necessity) to broadband access is ludicrous. Rodney Foster, Maumelle, Arkansas

I grew up near Paris. Five years ago, only France Telecom could provide DSL access. For €50 you got 512 Kbps. Today, you can get 20-Mbps internet access, unlimited national calls, and about 100 digital TV channels for less than €30. Anywhere you move, at least 20 DSL companies fight to have you as a customer. Now, live in L.A. and spend \$45 a month for a 3-Mbps cable connection, because the only company offering DSL in my area stops at 386 Kbps. What's going on? Nathan Hux, Los Angeles, California

Get Your Knockoffs Here

Re: Bruce Sterling's "The Share Economy" (view, issue 13.03). Since when is Serbia and Montenegro at the crest of the global wave of counterfeit goods? The country's poor, but none of the fakes are made domestically. Walk around Manhattan and there will be plenty of fakes. Recently released yesterday available today on DVD. Wherever there's poverty, there'll be cheap goods. Dan Kovacevic, New York, New York

The short story "A Little Wire" in *Wire*'s March issue was a pleasantly surprising Virginia Davis cartoon. I hope she'll have more. "A Little Wire" is a clever parody of a system of wires as good as the Austrians have and its political implications for our government.

RANT + RAVE

Wire submissions should include the writer's home address, and daytime phone number and be sent by email to editor@wiredmag.com or by mail to Rants + Raves, Wire, 520 Third Street, 3rd Floor, San Francisco, CA 94103. Submissions may be edited or lengthened or shortened and may be published or used in any medium. All submissions become the property of the publication and will be accepted without return. Resubmission of material after a year is not acceptable.

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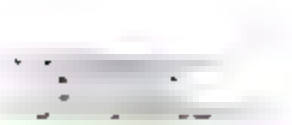
Get a special letter in Wire's 1st year in postal address. See page 72 for details.



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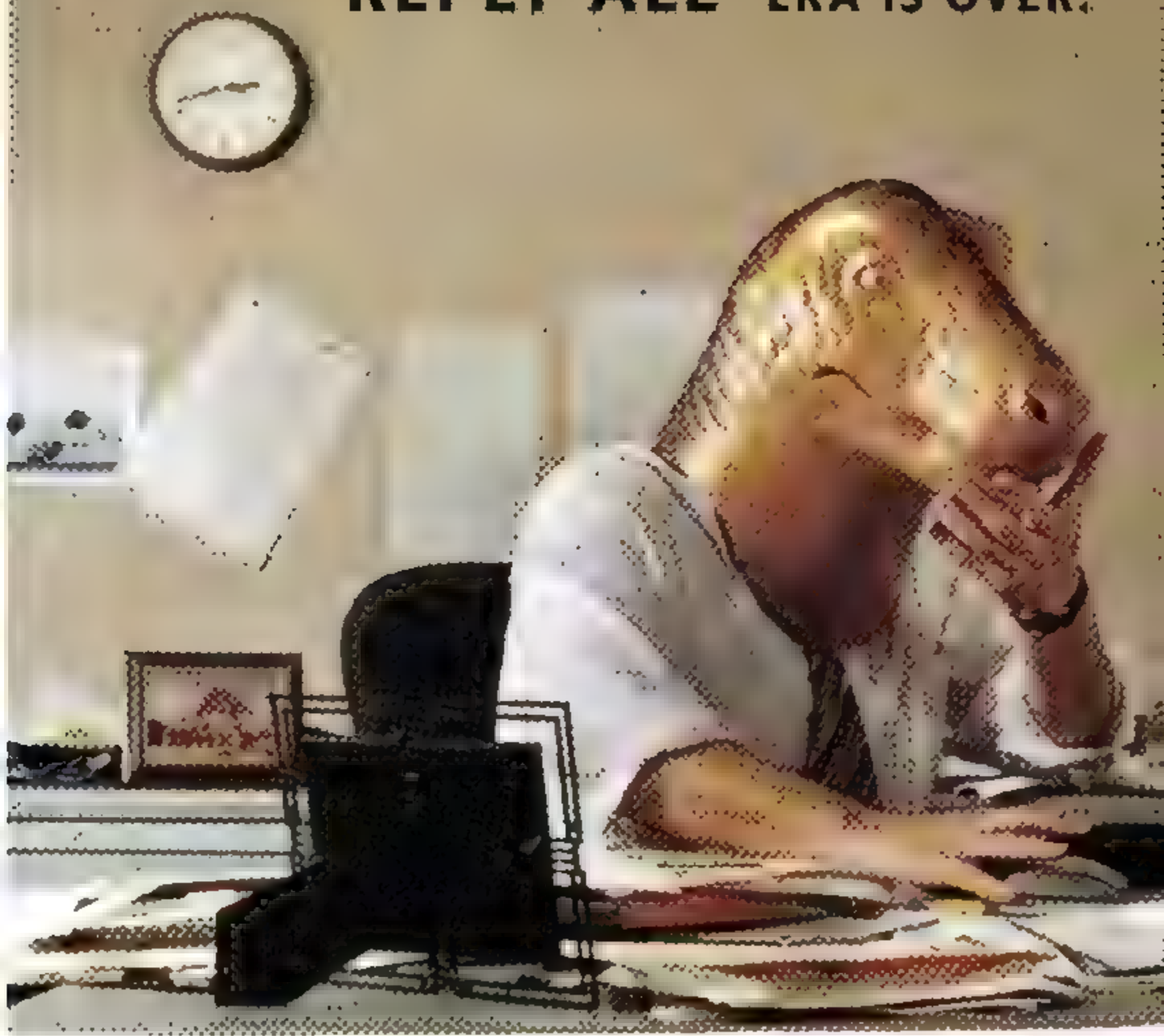
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Pandemic

We've got some great tools in place to help thwart pandemics. Our ability to communicate internationally is improving. We're also better equipped to deal with a language hygiene and safe behavior worldwide. Even so, as the population grows and moves into new locales, and international travel becomes easier and more prevalent than ever, the odds are for people to come in contact with new, deadly diseases. SARS taught us to be prepared for this possibility.

Modern medicine has a hard time identifying microbes like AIDS and bird flu. What many people perceive as an age of medical miracles is actually a psychotic break from reality. In the late 1980s, the surgeon general suggested it was time to "raise the book on infectious diseases." However, we have seen not only a resurgence of old diseases but the birth of many new ones. Today, about one in three people worldwide dies of infectious disease.

We can do a lot more to stop pandemics. Take AIDS. The Western world has a bizarre sense of morality that dictates our policy. Countries like Africa, on the other hand, are not. They're using methods of prevention. Not only is it spreading like crazy, it's also constantly transforming itself. As long as we see disease in other parts of the world as a foreign problem, we're setting ourselves up for new strains that we're not ready for.



The New Multiple Personality Disorder

Credit-reporting agencies make mistakes. It's time to ask your records straight **by Gary Wolf**

Our reputations are running out of control. Multiple versions of us exist in the data sphere, so many that we hardly recognize ourselves. For instance, according to Experian, one of the big three credit-reporting agencies, my wife is a man named Alan.

This mistake may be liable to correct on its own. Experian has never done anything to enlist my aid. In fact, were I to ask to see my file again during the next 12 months, Experian would charge me a fee. So I'm

reliving the error once. Given the aughast security of these databases, there's a perverse satisfaction in knowing that much of the information in them is wrong.

Recently, connoisseurs of database folly have employed some major databases. First ChoicePoint, an Equifax spinoff that contracts with businesses and the government, admitted that it accidentally gave nearly 150,000 detailed personal dossiers to criminals bent on committing identity

★ theft. Then Bank of America confessed to losing computer tapes with sensitive financial information on more than a million customers, including dozens of US senators.

Hearings were held. Apologies were made. Senators proposed bills of reform. And yet to this day, information about us continues to propagate through the networks of private companies in a way no regulatory regime appears willing much less able to stop. So, as our datasphere Doppelgangers go wild, we search for a spell to pacify them, bring them to heel, even eliminate them. We want to reassert control over these phantoms, which we think of as rightfully belonging to us.

But do they? When you look closely, it's hard to find any logic in the idea that our personal data is private property. The very existence of our reputation arises from the fact that information is shared. As we buy and sell, borrow and repay, our identities multiply, accumulating new qualities and scars. This is a good thing. Yes, the promiscuous accessibility of personal information has given rise to a spectacular crime wave, but it has also vastly expanded our networks of trust. Our reputation precedes us, and this

competence are influenced by Google's page-rank algorithms. And these systems rely on automated processes that aggregate minor human actions into public judgments that are nearly impossible to appeal.

Why, then, are the credit-reporting agencies reviled while systems like eBay are widely admired? The answer has to do with the architecture in which our digital doubles roam. Commercial data vendors are stubbornly clinging to their early 20th-century origins as card files full of private dope compiled to keep a local merchant from trusting a deadbeat. In those days, data vendors had no contract or relationship with the people on whom they compiled reports, and they still don't. Credit agencies are hostile to consumers who want to know what's being said about them. Negative information can go unnoted for years until suddenly resurfacing as punishment from a lender or retailer. There is little chance to change bad comments, even if the original report is inaccurate.

On eBay, by contrast, when you get a black mark you immediately know who gave it to you and why. The news that feedback has been posted arrives by email. The design of the system acknowledges that both parties

EBAY HAS MADE ITSELF A TRANSPARENT BROKER, NOT A BUREAU OF RUMORS

is exactly what allows us to form links with strangers without starting from scratch.

Besides, the data on which our reputation is based does not exist in a single file that can be locked away. As Bob St. Ives points out in his book about identity theft, *You're Evil, Twin*, credit reports are created on the fly in response to specific requests. The reporting system reaches into a database of "credit events" and draws out all those linked by social security numbers and similar names. The events are based on reports from countless firms, and "the digital person" as law professor and privacy expert Daniel Solove calls it in his new book by that name, emerges like a flickering image from a conglomeration of data.

Credit bureaus and large commercial data vendors may be at the heart of the recent scandals, but they represent a shrinking fraction of the reputation economy. Tens of millions of eBay transactions rely on extraordinarily effective techniques of reputation management. One study showed that a good eBay reputation has a value of more than 8 percent of an item's selling price. Meanwhile, news sifted by reputation-based systems like Slashdot and Digg influences about our professional status or

reporter and reported-upon, share an interest in the data. Although feedback disputes are common, eBay has made itself a transparent broker rather than a bureau of even more rumors.

This should be tried on a larger scale. Why isn't there a company that offers general care and feeding of our digital selves—a firm that would accept and maintain records of all our transactions and that would analyze and score our behavior, guaranteeing to keep this private until we gave permission for a lender or anybody else to learn more about us?

This new type of information broker—and there's no reason here couldn't be several—would have a stake in our reputations and its own. And by making the terrain in which our doubles roam more accessible and more secure from abuse by others, this hypothetical company could empty out the rickety data neighborhood whose bad design makes them so dangerous.

The change I'm suggesting can be summed up in the old schoolyard taunt: If you're going to say something about me, say it to my face. And don't mean this as a threat. I mean it as an invitation. Contributing editor Gary Wolf (gary@earthlink.net) wrote about Microsoft's open source future in issue 13.02.



MEDIA

Subscription Overload!

Can it be the digital lifestyle tax if you want to be plugged in to the Web, music, TV, movies, news, and phone networks, you have to pay. And pay. And pay some more. How much will all those subscriptions cost you? Almost as much as a car payment. **Mark Roberson**

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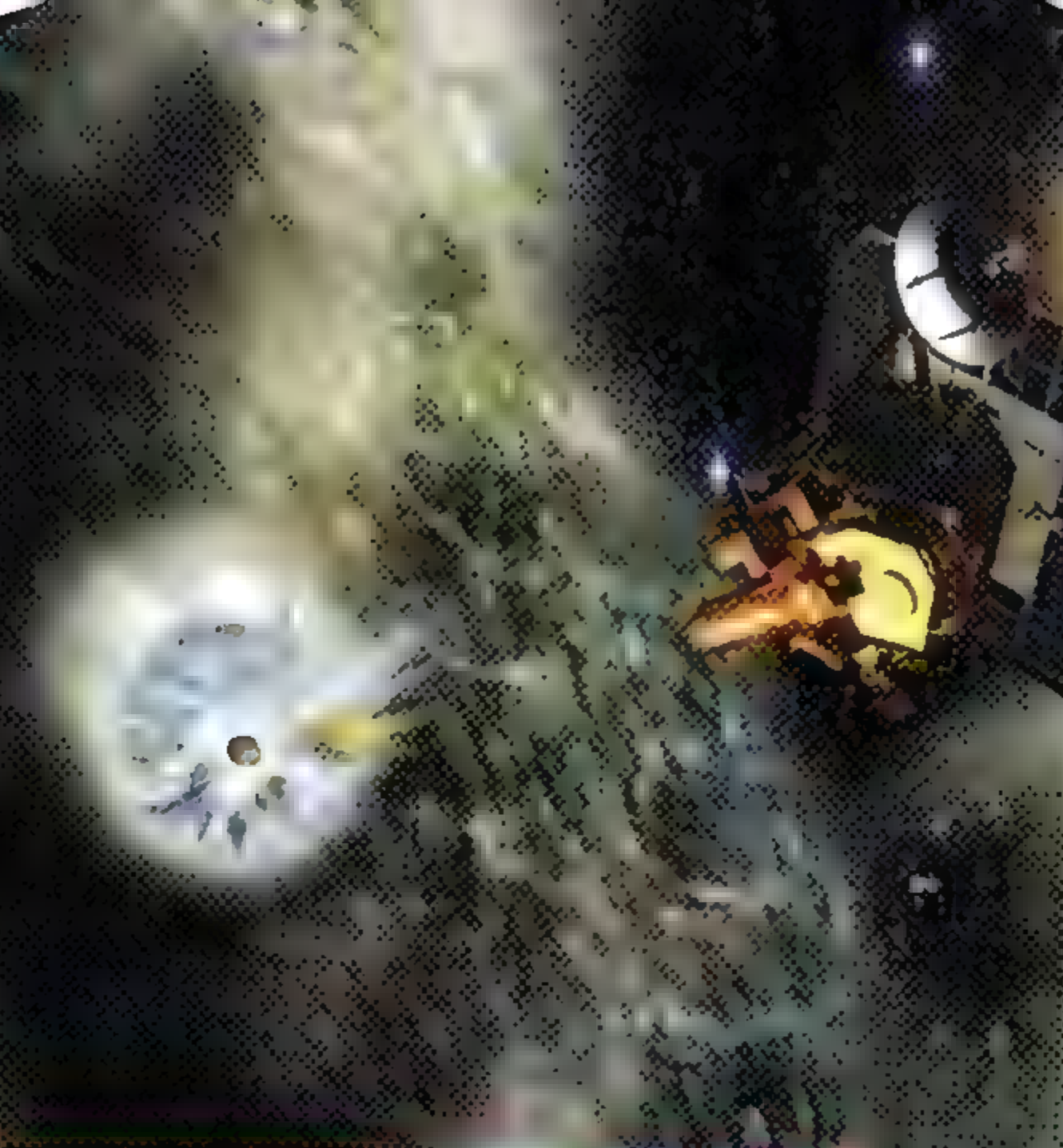
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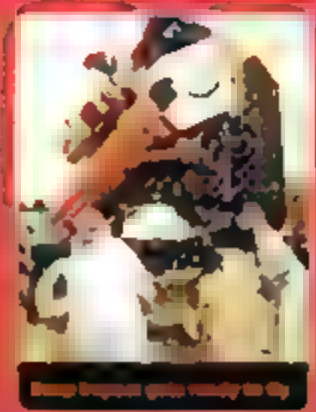


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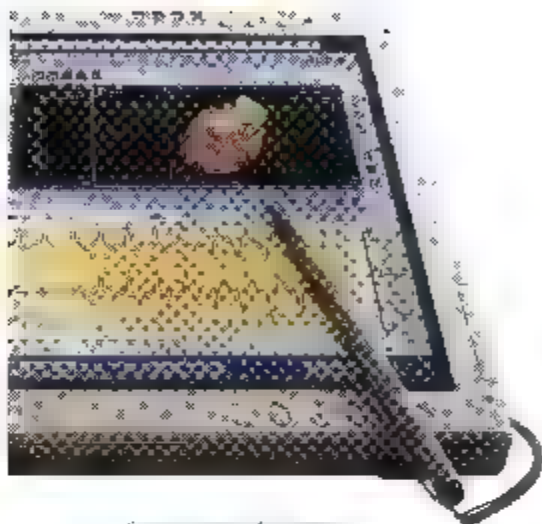


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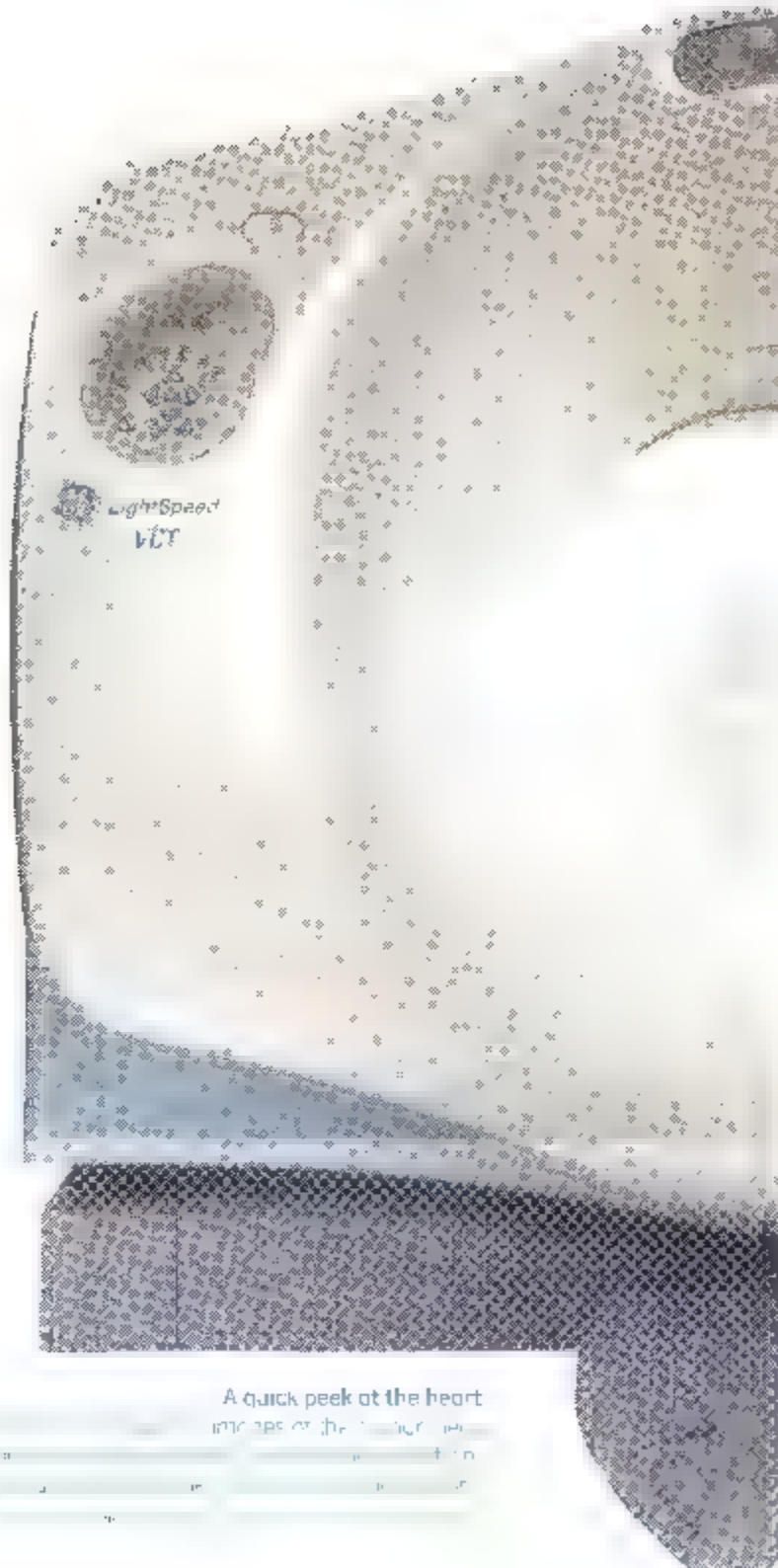
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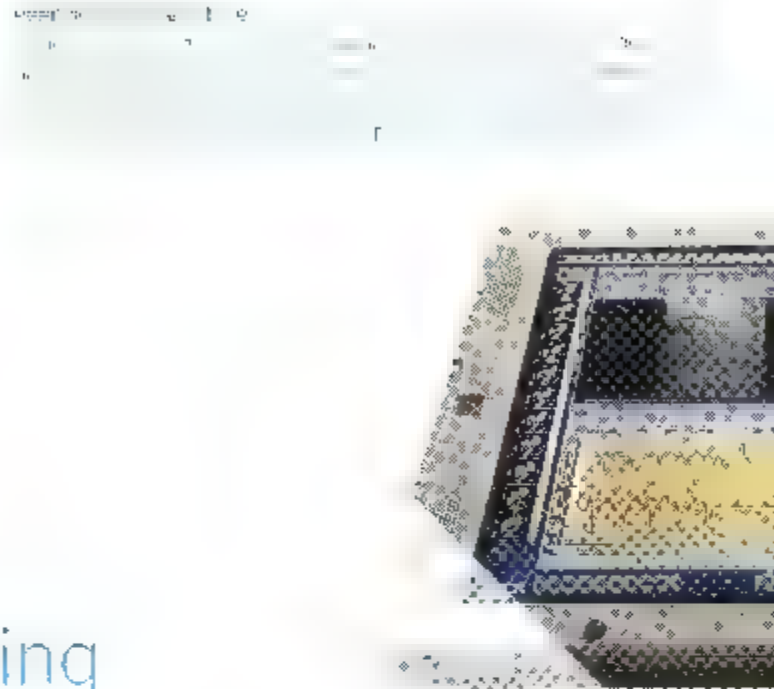
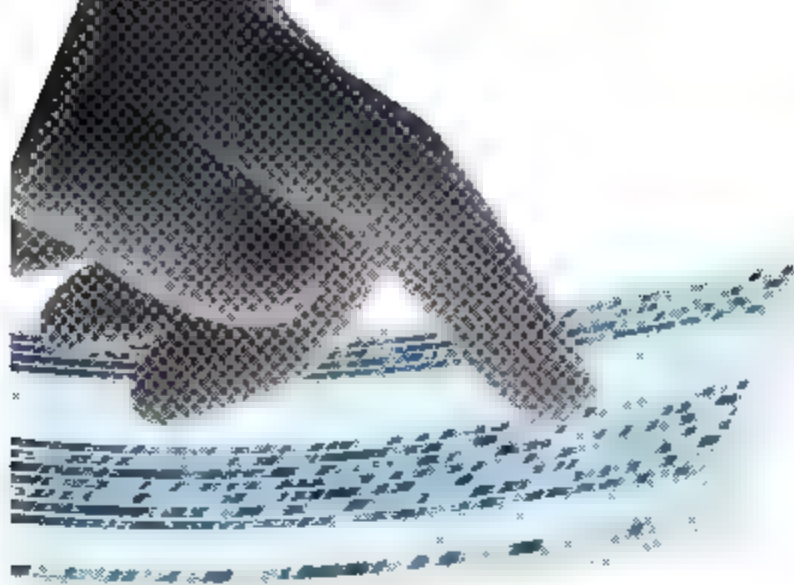
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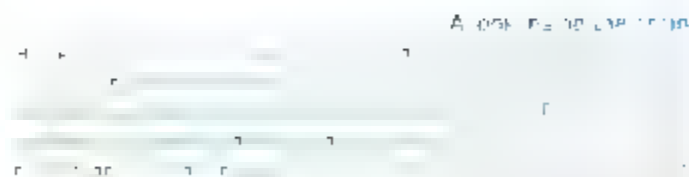
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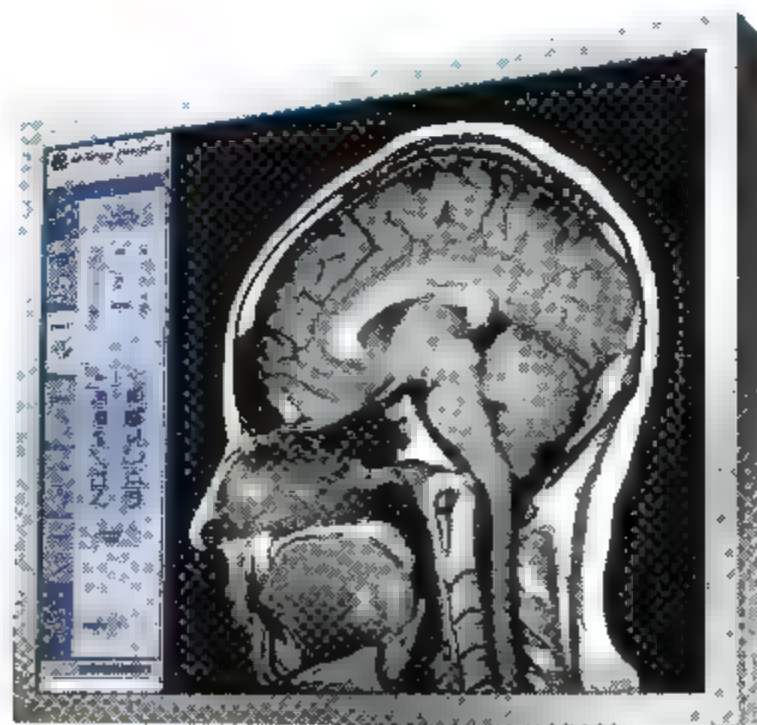
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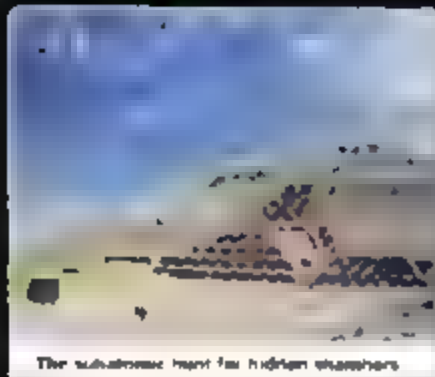


CCMEAT

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Therefore, the probability of getting two heads is $\frac{1}{4}$.



The autonomous heart has hidden reserves

457 HAE 0

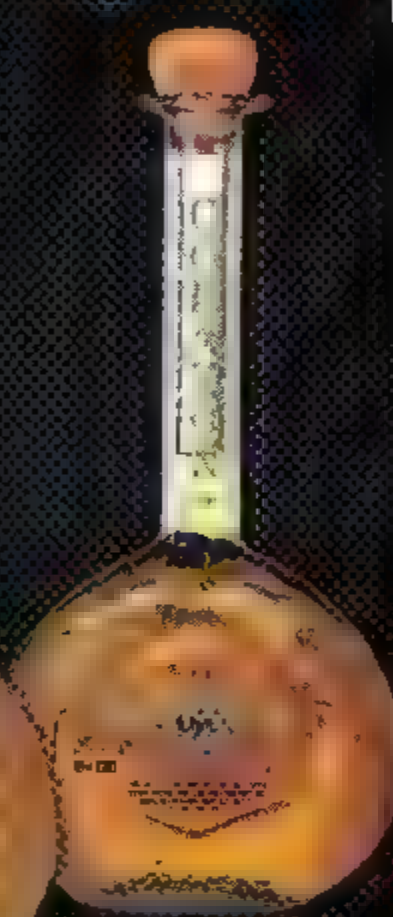
In a cramped passageway 35 feet below the Pyramid of the Sun in Teotihuacan, Mexico, intrepid explorers are looking for some clue as to who built the 2,000-year-old structure and the city around it. These particular researchers are none other than Robert Schoenberger from Indiana Jones: They're peering into the pyramid with fluorine, ultraviolet particles created when cosmic rays hit Earth's atmosphere.

Traveling at nearly the speed of light, muons have enormous penetrating power — still to prove half as safe as solid rock. (Scientists are using them to map lava tubes in active volcanoes and to try to find nuclear contraband in shipping containers.) Physicians with the National Autonomous University of Mexico are using mean densely levels to scan Tlaxcala for nukes, perhaps the tomb of the mysterious Olmec's rulers. Preliminary experiments suggest their detectors can find walls larger than 20 feet across. Think his amount to show a hot job, isn't it? — Bill R. Stepien

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This is New York

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Patrick O. Jurek

400 YEARS OF RATS AND REAL ESTATE

The lower image follows across the river Manhattan - most of the city. Of course, some of the landscape has changed, and so has what lives there.

1609

2006

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300 bad passenger
2000 people, both now and then

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400,000 people in the city

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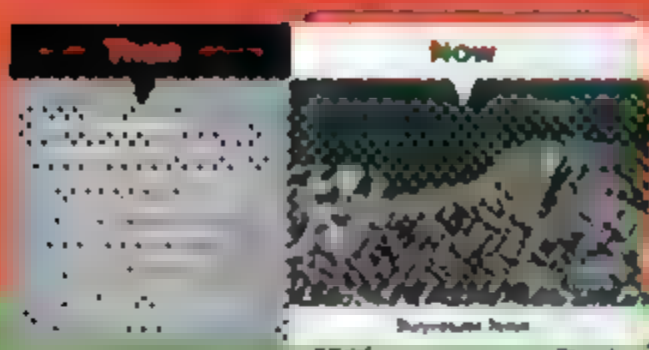
400,000 people in the city

400,000 people in the city

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Manhattan, New York





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SAFETY THROUGH INNOVATION

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Shockingly Small Change

Brian Basura may be a bit power-mad. He has set atop the world's longest Tesla coil with a they spot multicolored volarcs 20 feet into the air. He has shot white-hot electrical streamers from his fingertips. And he built the Quarter Shrinker you see here.

Nestled in the garage behind Basura's house in Acton, Calif., is the Quarter Shrinker: a 22,000-volt capacitor outfitted with a trigger, an ultrafast switch he designed. It unleashes 10,000 megawatts of instantaneous energy—roughly equivalent to the output of 10 coal-fired power plants. Basura, a 45-year-old glass press manager at Crawford Printing, usually focuses a flat disc on a U.S. quarter. When he does, the coin doesn't melt or vaporize. Instead, with an ear-shattering crack, its molecules rearrange and fizzle, closer shrinking the coin's circumference to that of a dime. "It's pretty magical," Basura says. "The first time you see this stuff work and you hear the electricity buzzing in the air—it's absolutely amazing." And it's a relatively cheap thrill. He says his Pacific Gas & Electric bill hasn't been any higher than usual. —William Gustafson

Jargon watch

False fan

The consumption of on-demand music, movies, television, and other media that caters to individual—and not mass-market tastes. Critics argue that it's leading to a culture of isolated iPod and TiVo users with no shared reference points.

Ashlee Simpson

False fan revues posted online by record company shills. Coined after Warner Bros. used the tactic to promote Ashlee Simpson. The term descends from *asinxurfing*, or disguising organized campaigns as grassroots movements.

Builder

Among Lego enthusiasts, a builder who customizes bricks, sensors and other components to add utility to Lego creations.

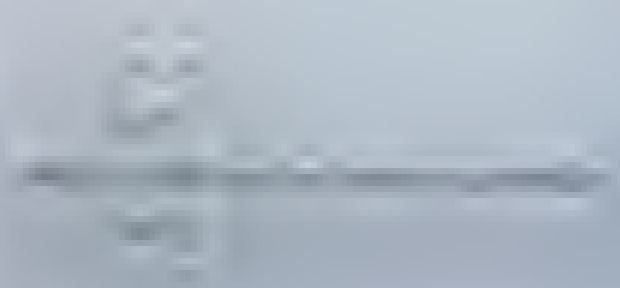
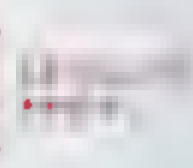
Wi-Fi car

Using a Wi-Fi card and a laptop to drive around, sniff out, and listen to other people's iTunes libraries. Derived from *wardriving*, the practice of cruising to open Wi-Fi hot spots.

Wireless jargon

jargon@wiredmag.com

Thanks to contributors Kari Jordan and Mark Frazer-Kelly





WATERCRAFT

Sea Monster

The 118 **WallyPower** looks like it was dreamed up by a B-2 bomber with a sailing obsession, and the \$26.7-million superyacht was produced by a European doozyette with designs on the Triump end of the market. With its vertical bow, composite hull, and trio of 5,600-horsepower gas turbines, the 8-ton Italian continues eight passenger and four crew members, has a range of 800 miles, and can do 80 miles per hour. "People today save less time," says Luca Bassani, founder and president of Monaco-based Wally, which has built just one of these so far. "They want to go to St. Tropez in the morning, Portofino for lunch, and Sardinia in the evening. And yet the craft is so quiet you can hear the conditioning in the cockpit. Shark and awe meets gin and tonic." **Matthew Stibbe**

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Deep
Tracks



blues & jazz

SOUL
SERIES

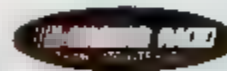
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White People Can't Text

Why did Sean "P Diddy" Combs—clothing designer, Broadway actor, MTV icon—deliver the keynote at this spring's CTIA wireless trade association conference? Because he was the only guy in the room who had the 400 CTIA members wanted to sell content over cellular networks. Combs, a tastemaker in music and fashion, has just the right products to move—and the right audience. So does Russell Simmons, founder of Def Jam Records, who's launching Def Jam Mobile. The data says that African-Americans, Latinos, and Asians want lots of cell phone services: SMS, photos, ring tones. They're over and done, it's whites who can't let go. "You don't need a computer when you've got a Web browser on your belt," says Def Jam Mobile's Theda Sandford. "In hip-hop culture, having the latest and greatest technology—whether Jordans or pagers or cell phones—has always made you sexy." Geeks: time to Google "hyphy." —Patrick Di Justo

WIRELESS-ONLY HOUSEHOLDS

African-Americans	24%
Asians	18%
Latinos	17%
Whites	10%

AVERAGE MONTHLY BILL

Latinos	\$54.66
Asians	\$50.94
Whites	\$48.72
African-Americans	\$49.25

GET WIRELESS DATA

African-Americans	20%
Latinos	12%
Whites	7%

WANT TO BUY RING TONES

Latinos	21%
African-Americans	20%
Asians	20%
Whites	1%

WANT TO SHARE PHOTOS

Latinos	19%
African-Americans	18%
Asians	18%
Whites	7%

Source: Forrester Research

PANTS

The New Wrinkle

Fashionable ever since James Dean rebelled sans cause. The problem is, your dungarees have to look beat up to confer any kind of class—and getting them properly thrashed is harder than it sounds. In the '60s and '70s, wear and tear was the way to go, motivated by peaches. In the '80s, acid washes ruled. And for butt huggers with high-contrast thighs from, like, so five minutes ago? Bleach. Today, pre-damaged jeans account for one out of every five pairs sold—and manufacturers from Kentucky to Guatemala use a sort of witch to apply hyperness. **Suzanne Wu**

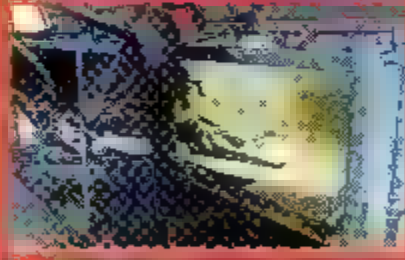
How Jeans Go From Blue to Badass



Textile makers coat yarn with polyvinyl alcohol and starch for strength, and paraffin to make it easier to weave into cloth. Those chemicals also make for really stiff pants. For the form-fitting progeny of Brooke Shields, Calvin Klein, manufacturers "desire" with amylase, a starch-busting enzyme found in saliva. Or alkaline chemicals like soda ash.



Who has the patience to break in a new pair? Textile companies wash jeans with cellulase, an enzyme that breaks down cotton—and often add fist-sized hunks of pumice. More than 70 percent of denim is "stone-washed" this way, from \$25 Wal-Mart specials to \$176 A-pocket Savona. Harshly treated jeans don't last as long. *—Jeff Guss, Jilarte Studios*



To create holes and tears, manufacturers get violent. Boutique lines like Sweden's Nudie Jeans get sand-blasted with aluminum oxide. Or denim is blasted with sandpaper (200-grit for minor fraying, 60-grit for serious fraying). Or, as tools of the trade, drills, creams, razors, box cutters and shotguns. The next big trend? Hand-sewn repairs, naturally.

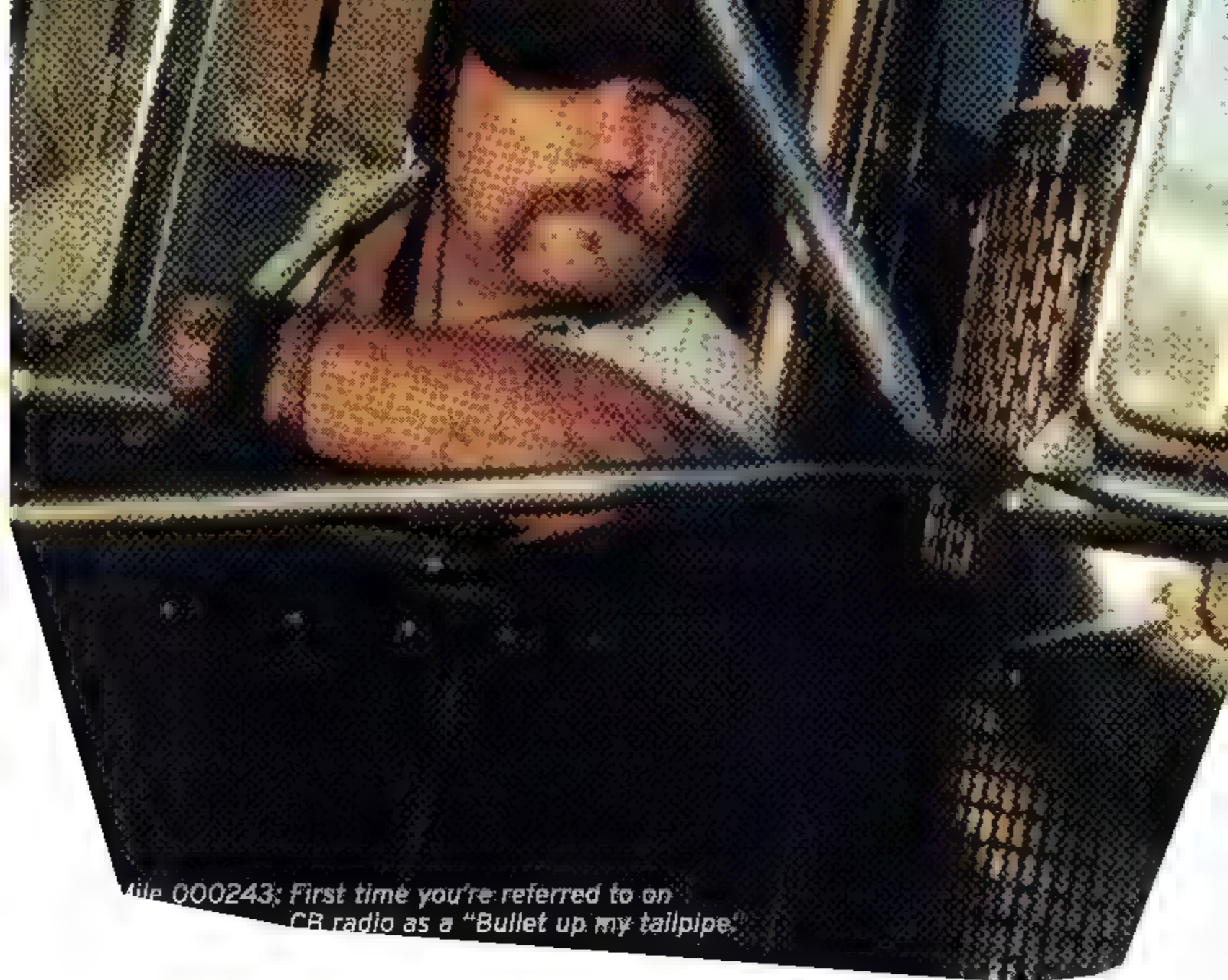


For the kind of fade that comes from friction and sun (think exorcise shirt, not fidgeting in an office chair), you can't just use Clorox. Automated sprayers at the factory crank up to 20 passes with a diluted bleach solution, manufacturers or companies like Diesel spritz 550SL then go back in with green, purple, and yellow washes to achieve the life shades of dirt and grease.



Wrinkled jeans look lived in—even when they haven't been. Taking inspiration from pants that eschewed their owners for a fashion ad way, lines like Paper Denim & Cloth invert the process that makes khakis wrinkle-free. The recipe: crumple jeans, spray with a resin, and then bake at 325 degrees for 10 minutes for bottom-of-the-barrel appeal.





Mile 000243: First time you're referred to on
CB radio as a "Bullet up my tailpipe."

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video games are a bad influence on kids surely isn't a very strong argument. Most of the time, the games are the only thing that keeps them from getting into real trouble. And, as a result, they're actually saving lives. Little kids aren't getting into cars, or climbing trees, or playing with matches, or anything else that could get them hurt or killed. They're just sitting there, playing their little video games, and the world is a safer place because of it. The only bad thing about video games is that they're so addictive that kids don't want to stop playing them. But that's not a bad thing either. It means they're having fun, and that's a good thing. So, video games are a bad influence on kids, but only if you think about it that way. If you think about it the right way, you'll see that they're actually a good influence. They're keeping kids safe, and they're making them happy. That's a good thing. So, video games are a good influence on kids. They're a bad influence on adults, but that's a different story. - Eric Stein







baseball in DC

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Master George hasn't won Oscars for storytelling, but *Wired* readers still totally heart him. Of 1,023 surveyed, 77 percent raved about the *Star Wars* franchise, apparently succumbing to the Dark Side and overlooking his staid Japanese writing and acting issues. (E After Dark, page 134.) But 36 percent favored *The Empire Strikes Back*, which was *not* scripted or directed. Coincidence? These aren't the droids you're looking for. Move along.



-  A triumph of special effects
-  Epic storytelling
-  Failed plots and performances
-  Three words: Jay Jay Blinks



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ANIMATION DOMINATION



Surrender
your
Sundays!

KING
HILL

Malcolm
McMiddle

THE
SIMPSONS

FAMILY
GUY



THE NEW FOX SUNDAY BEGINS MAY 1ST
FOX

Germ's Aren't as Scary as You Think

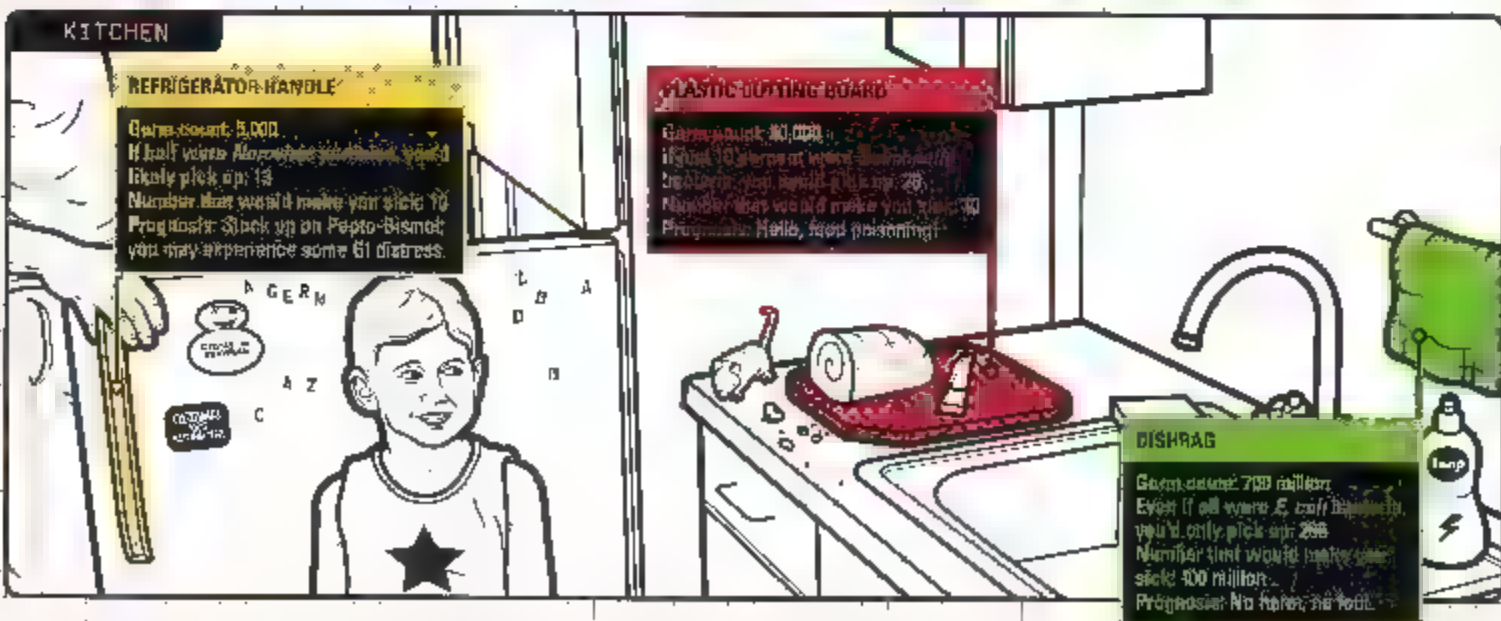
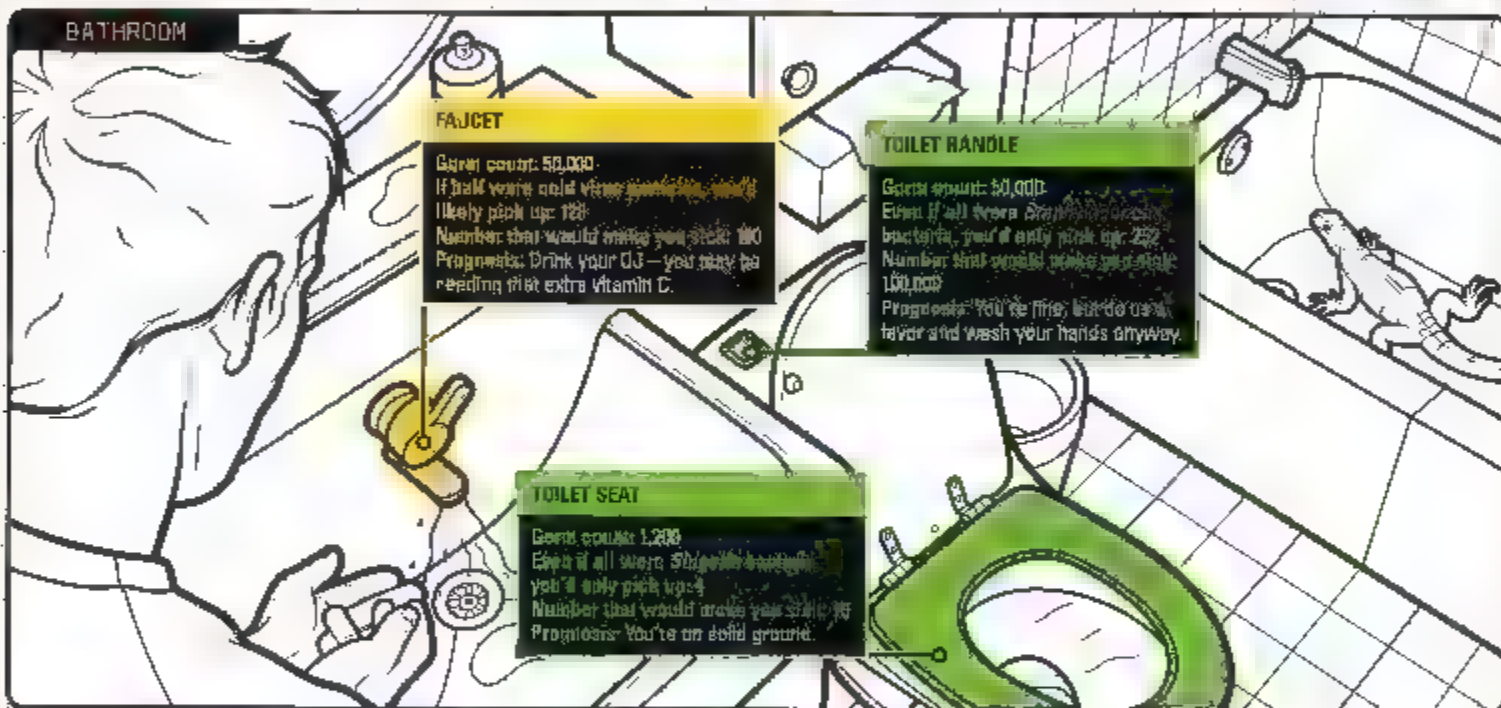
The little beasties that lurk on common surfaces are rarely enough to make anyone sick.

Americans spend at least half a billion dollars a year on antimicrobial products, and with good reason. Viruses and bacteria can survive hours, even days, on inanimate objects. Sounds scary, but the nation's germ phobias are blown out of proportion. The typical bathroom hosts a microbial stew, but the bacteria usually don't exist in sufficient quantities to make you sick. Even out on the bugs on, say, a toilet handle are *Staphylococcus* bacteria, but the chance of those you touch transfer to your hand, and only 1 percent of those get past your mucous membranes—eyes, nose, or mouth, and into your body. That's not enough to infect you. What's more, most of us don't touch the toilet handle. Like the dishcloth in your kitchen, it's even less efficient at spreading germs. Only half of 1 percent even make it to your hand, and in the end, what matters most is which germs have taken up residence in your space. It takes 100 million *E. coli* to make you ill, but a single virus particle can give you the flu. So quit worrying about dirty restrooms and viral shopping carts. —Gretal Large

RISK LEVEL

High
Medium
Low

Germ counts are per square inch.



OFFICE



KEYBOARD

Germ count: 3,000
Even if all were *Streptococcus lactiae*, you'd only pick up: 15
Number that would make you sick: 1,000
Prognosis: Good news: no sore throat for you.

DESKTOP

Germ count: 20,000
If half were cold virus, you'd likely pick up: 51
Number that would make you sick: 130
Prognosis: Barring you'll call in sick tomorrow.

TELEPHONE RECEIVER

Germ count: 25,000
If just 1% percent were *Staphylococcus aureus*, you could pick up: 25
Number that would make you sick: 10
Prognosis: You've got diarrhea? Or not? If you've broken out, it's 40% probably.

PUBLIC SPACES

BUS STOP

29 Mon-Fri



SHOPPING CART HANDLE

Germ count: 1 million
If just 10 percent were *Salmonella typhimurium*, you'd pick up: 500
Number that would make you sick: 1
Prognosis: Probably should have gotten a flu shot.

CASH MACHINE

Germ count: 150
Even if all were *Staphylococcus aureus*, you'd only pick up: <1
Now many would make you sick: 100 billion
Prognosis: You're flush, not flushed.

HANDRAIL

Germ count: 3,000
Even if all were *Streptococcus lactiae*, you'd only pick up: 25
Number that would make you sick: 100,000
Prognosis: Get a grip. The handrail may be dirty, but it won't infect you with anything.

architecture

0545

PLAY

may



Think *The Godfather* has old on foot land.

game of bird-and-egg in Florida.

Forty odd attributes speed toward the finish line in Florida. Cheer on these 10 don't die.

this year's event is a cartoon to 5,000 fans.

by Pennie Rossini

The Hitchhiker's Guide to The Hitchhiker's Guide

It took years of Douglas Adams' time to write the *Galaxy* but he got through the stages of making it a movie. Adams' first idea was a BBC TV show, but it was shelved. He then had a chance to make a film, but the movie version was shot in 1981. The film was a disaster, which followed Adams' death in 1979. The film was just an TV being disrupted in mid-air. Adams' first idea was a BBC TV show, but it was shelved. He then had a chance to make a film, but the movie version was shot in 1981. The film was a disaster, which followed Adams' death in 1979. The film was just an TV being disrupted in mid-air. Adams' first idea was a BBC TV show, but it was shelved. He then had a chance to make a film, but the movie version was shot in 1981. The film was a disaster, which followed Adams' death in 1979. The film was just an TV being disrupted in mid-air.



STUDIO CITY: PAPER: How the Film Differs From the Book



Adams wrote some 85 percent of the screenplay before his death in 2001. What's new: The studio exaggerated a bit on the welcome. Dent and Trillian are the only two who are left after the first 10 minutes. The film's opening number with singing dolphins that thank Earthlings is a nod to the book's opening number with singing dolphins that thank Earthlings.

★★★



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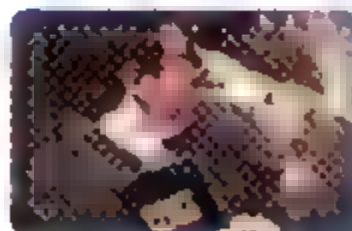
AMC FACTOR

★★★



The film's relatively meager \$100 million budget didn't support a high-tech extravaganza of aliens, gadgets, and exotic locales as the *Star Wars* series. The film's opening number with singing dolphins that thank Earthlings is a nod to the book's opening number with singing dolphins that thank Earthlings.

★★



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★

Mind Over Metal

System of a Down's hacker aesthetic rocks the mainstream.

Although it's often lumped in with lunkheaded nu-metal bands like Limp Bizkit, System of a Down makes some of the smartest music in mainstream rock. The L.A.-based quartet's complex instrumentation and innovative production techniques produce a provocative fusion of punk, prog, and indie rock. The driving force behind System's style is guitarist and songwriter Daron Malakian, a gearhead whose hobbies include studying sound design and engineering guitar hacks. After the band sold 5 million copies of the 2001 album *Toxocity*, Malakian holed up in his house and wrote more than 100 songs—roughly 30 of which are on System's upcoming two-part release, *Mezmerize/Hypnotize*. *Mezmerize* is due in May; *Hypnotize* will follow some six months later. *Wired* talked with Malakian about his megalomaniacal career. —Erie Steuer

WIRED: It's been four years since System's last major release. What took you so long?

MALAKIAN: I spent a lot of time in pre-production. There were months on end where I was locked up at home, writing and obsessing about how to record the wild sounds I had in my head.

How did you finally pull off the brain dump?

A lot of experimentation. Like for one song, I put together a room where I covered the walls and the ceiling with dozens of acoustic guitars. I set it up so that the noise that came out of my amp resonated with the vibration of all the guitar strings in the room and created this really unique tone.

Got any other hacks up your sleeve?

I have one of those crazy double-necked guitars like Jimmy Page played. I turned the pickups off on the

bottom neck and let the top neck's pickups on. I played the strings on the bottom neck and got an awesome drone sound that I used on a few songs. My experiments don't always work out so well, but when they do, there's a huge payoff.

Dude, you truly are a music geek.

I love the fine tuning of it. When we were recording his album, I spent days working on a single snare drum sound. Music's my life. Well, like hockey too, but not in the same way.

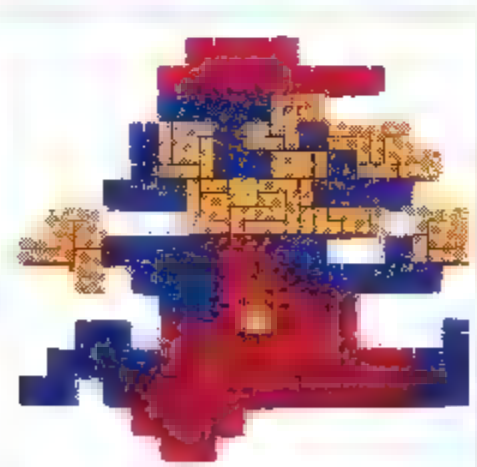
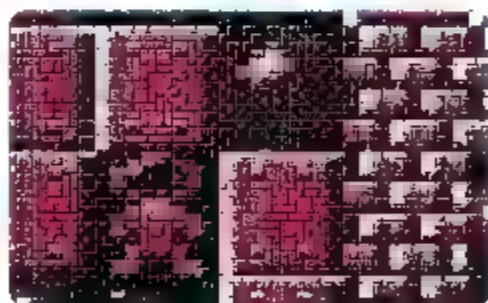
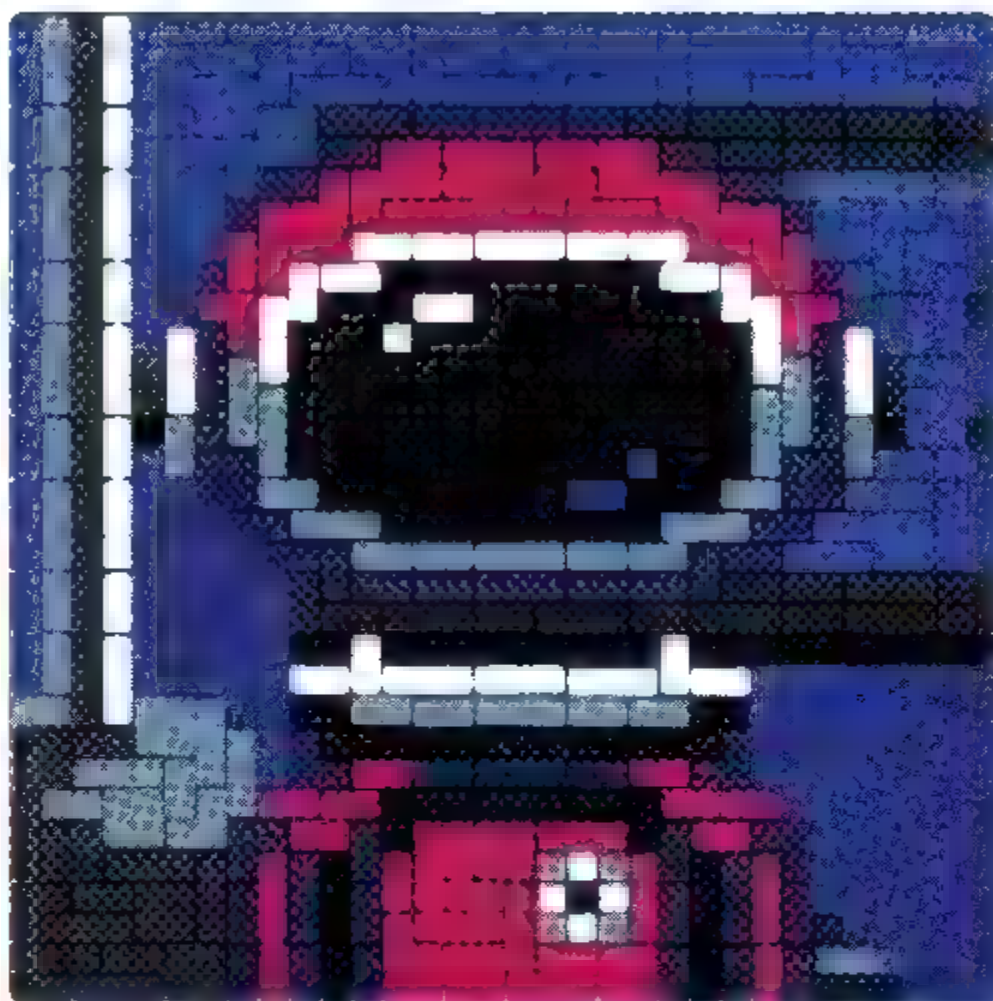
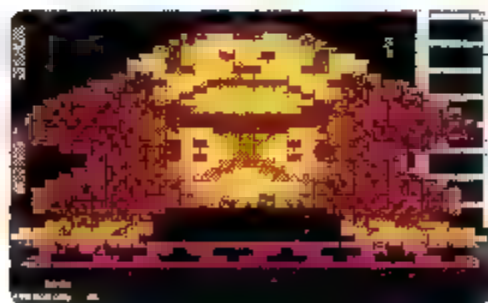
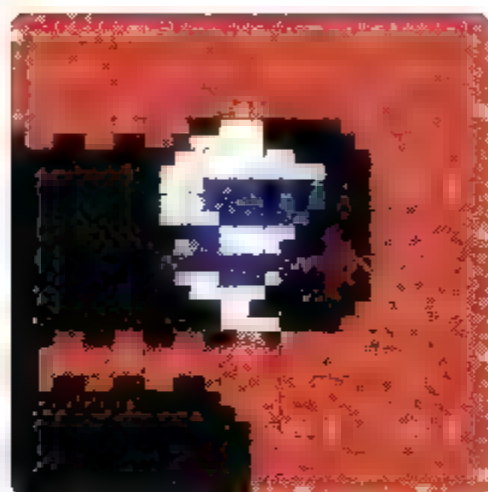
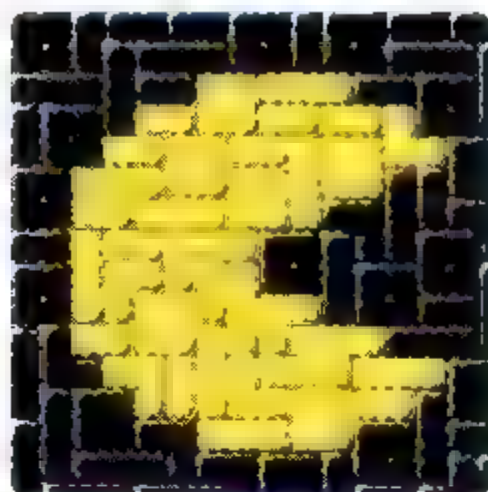
Why release *Mezmerize/Hypnotize* in two parts?

Everybody's walking around with 1,000 MP3s in their pocket. We put out so many songs at once, we'd be inundating people who are already suffering from music overload. This way we're giving people time to develop a relationship with a smaller batch of songs.

So it's a statement about the experience of listening. Absolutely. We still put out albums out on vinyl for the same reason. Because when you play a record, you can't just skip around through tracks like you do with CDs or MP3s. You actually have to get out of your chair and turn the record over when the side's done. Physical interaction requires you to focus on the songs in an entirely different way.

What are you listening to these days?

Anything by Kraftwerk. It's the most precise and perfectly produced music ever. We'll incorporate some of that stuff into our new songs, but the challenge is to do it without coming off like we're on some sort of corny retro trip. A lot of new bands come out sounding exactly like some '70s act. That's no modern rock—it's just classic rock done a million times.



Still Life With Pac-Man

German artist Norbert Bayer turns computer graphics into child's play. "As I was building Web sites one pixel at a time," he says, "it dawned on me that it was the same process as making a mosaic." Bayer has taken that idea to its logical extreme and re-created his favorite CG icons in Ministeck, a creativity game for kids popularized in the 1970s in which colored plastic shapes are placed on a grid to form a picture. Bayer begins with a screenshot, then uses software to adjust the graphics and colors to match the dimensions and palette of the Ministeck pieces. Finally, he builds the image with actual game tiles. A selection of his mosaics are on display through May 16 at London's Pearlfisher Gallery. — **Anneloes van Gaaen**

Modern Mosaics Norbert Bayer uses plastic game pieces from Ministeck to reproduce videogame stars clockwise from top left: Pac-Man, Zak McKracken and the Alien Alien, Boulder Dash, Donkey Kong, and Dig Dug

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IN ARMS:
ROAD TO HILL 30**

gearbox



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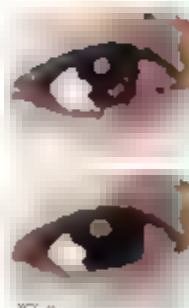
ati.com



street

Anime Eyes

— a porce ain. Eyes like Astroboy. The a es—rend for Japanese schno girls is co ored contacts—not green or blue ones that ape *gamin* eyes, but sky black ones that make them ook like they have gigantic monochromatic pupils. Thanks to a steady diet of manga and anime, Tokyo teens have come to admire the outrageous peepers on hand-drawn heroines. “The bigger the character’s eyes, the cuter they ook,” says 15-year-old Yumi Koba. And now, thanks to Share Generate’s Nadesico Back e theating Sailor Moon is no longer a dream. Because the lenses are nonprescription, schoolgirls can even order them—like everything else via cell phone. —Brian Ashcraft



270

The dark portion is larger than the iris, so the eye looks bigger.

s, cluff, inks, wrenches, nutprss, and bottle openers have it he when you, need one. These ate glass steel® credit card



id

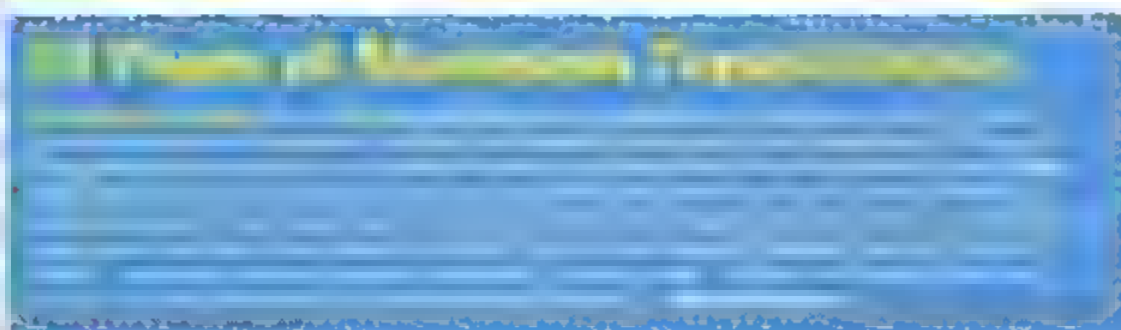
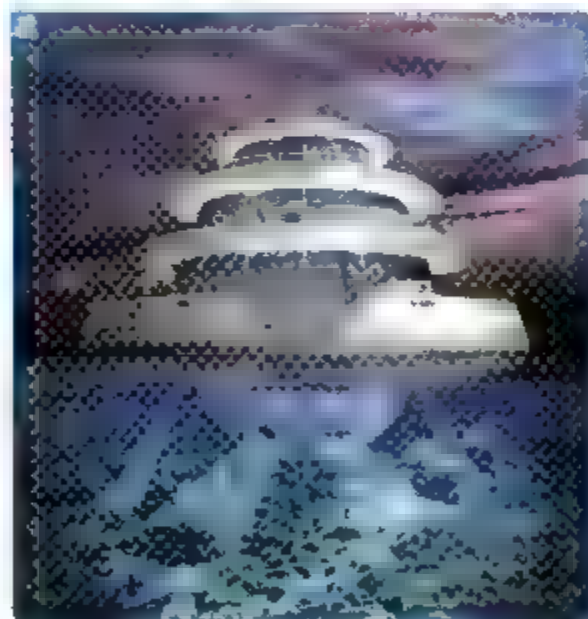
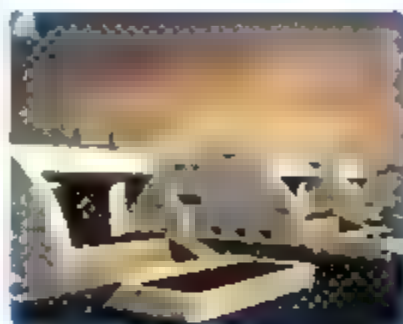


Waterworlds

Artificial islands. Amphibious buildings. In the new book *Water House*, Captain Nemo fan Felix Flesche and his co-author Christian Birchard present 60 innovative structures and design concepts, from a converted oil rig rising 1,480 feet above the Norwegian Shelf to a luxury hotel submerged some 50 feet below the surface of the Persian Gulf. "Atlantis is still alive," Flesche says. "I wanted to show the range of possibilities what we can do now and visions of the future." With roughly 70 percent of Earth covered in water, these aquatic outposts may be the solution to the high demand for beachfront property. **Suzanne Wu**



Amphibious architecture (1) A Norwegian Troll oil rig. (2) Hydropolis hotel. (3) The World archipelago of 300 man-made islands off the coast of Dubai. (4) Amsterdam's City Hostel. (5) Dutch Plan Tj "wet-footed" development. (6) Berlin-based water settlement. (7) Jelly-fish 45 floating house. (8) steel anchor for the man-made island of Kavar. (9) Palm Jumeirah artificial island homes.



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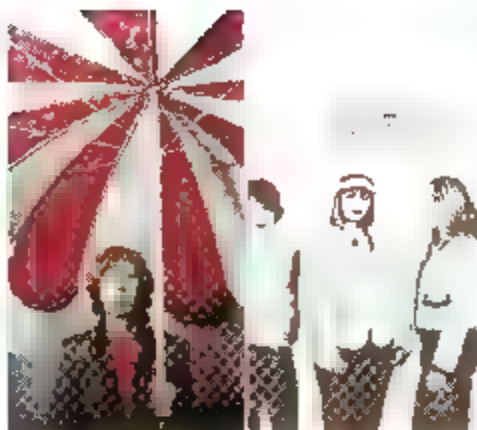
Saab



Top state
in regions d'origine

Beck Guero

Reports of a sea change were exaggerated: On the housing *Guero*, Beck shimmies forward by shuffling back to his last album for "Missing," to a *Midnite Vultures*-era croon for "Go It Alone," and into bobbieheaded *Odelay*-territory for much of the rest. Dust Brothers John King and Mike Simpson break out their turntables and microphones on the plunderphonic "Que Onda Guero?" Meanwhile, "E Pro" pairs a dirty blues-rock riff with a catchy "na na na" vocal refrain that's bound to show up in a Verizon Wireless commercial. **Sean Cooper**



RENTALS Kontroll

This is an underground film in the most literal sense: director Njörðr Ártur shot every minute of *Kontroll* in B-Idaest's subway. The movie follows a group of sad sack ticket inspectors as they corral fare cheaters and duel a rival squad while a cloaked psycho pushes riders in front of moving trains. This quirky and ambitious story is part comedy, science fiction and crime thriller. What holds it all together and makes it such a memorable ride? Ártur's punk-slapstick aesthetic and the gothic setting, which seeps into your bones. — **Jason Silberman**



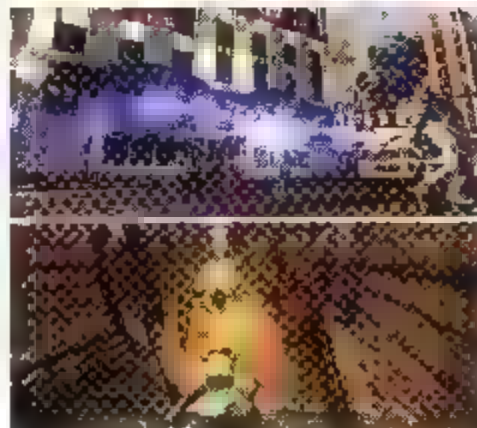
The Silicon Eye George Gilder

Legendary Caltech microengineer Carver Mead has a problem: His new company Foveon, is failing, despite the fact that its digital camera imaging chip is better, cheaper, and more efficient than the competition's. Gilder offers a compelling explanation of how more innovative technologies can succumb to weaker ones, but the story is muddled by the fact that Mead hasn't found a way around this issue. Of course this doesn't stop Gilder from slipping into full-on cameracoin, with Foveon sensors babysitting our kids. **Robert Cappa**



DESTROY ALL HUMANS

It's not easy being green. But in this wacky action game, you play an alien who finally gets the chance to stick his meekkind. Tool around in your saucer, infiltrate human society, lay waste to entire cities, and abduct the occasional cow. If you're feeling freaky, you can even perpetrate an orga probe. The campy tone and stylized design are ripped straight from a '50s sci-fi flick. In fact, Ed Wood's immortal *Plan 9 From Outer Space* is playing at a drive-in that's ripe for terrorizing. Up against the wall, earthlings. **Darren Gladstone**



Sleater-Kinney The Woods

Produced by indie fave Dave Fridmann, this exhilarating disc finds the riot grrrr graduates dispensing with their tart angle-pop format in favor of sludgy guitars and an explosive low-end. Tracks like "What's Mine Is Yours" and the 11-minute monster "Let's Call Love" take the trio to new ex-grodding, classic-rock-inspired heights. But the band's careful not to throw the baby out with the bathwater: Corin Tucker's shrill caterwaul is as viscerally charged as ever, and S-K's fierce political edge remains totally arresting. **Ken Taylor**

BOOKS Appleseed

Based on a comic book series by *Ghost in the Shell*'s Shirogami Masami ne, the story here is familiar: expect the usual anime claptrap about cyborgs and gunplay in a high-tech dystopia. What's revelatory is the computer-generated animation. It looks like the 2-D characters have leaped off the pages of a manga to kick ass in a beautiful 3-D world. Problem is, though this technique works great for action sequences, the dramatic scenes fall flat because the characters' faces appear stiff and emotionless. **Chris Baker**

Radical Evolution Joel Garreau

Washington Post reporter Joel Garreau lifts the tarp on Darpa's spittler-enhancement projects, clocks the acceleration of genetic engineering along evolution's steepening curve, and imagines standstills along with the world's foremost nano-cassandras and bio-pollyannas. As the singularity comes searing toward us, we must decide what kind of posthumans we want to be. Today's choices will make the difference between a tomorrow suffused with uploaded gray matter or a world destroyed by gray goo. — **Josh McHugh**

VIDEO Dungeon Lords

If you love the depth of role-playing games, but hate all the slow-as-molasses combat and math-heavy stat crunching, this gorgeous fantasy epic is for you. With a medieval tonne of cool loot to collect and flexible character creation tools, *Dungeon Lords* is complex enough to satisfy the 20-sided-dice brigade. But the action-combat system lets you skowk, roast, zap, and blow up a dozen orcs in the time it'd take to fumble through standard RPG. **Erik Wolpaw**

GOD OF WAR

A
NEW MYTH

WILL BE
WRITTEN
IN THE
BLOOD OF
THE OLD

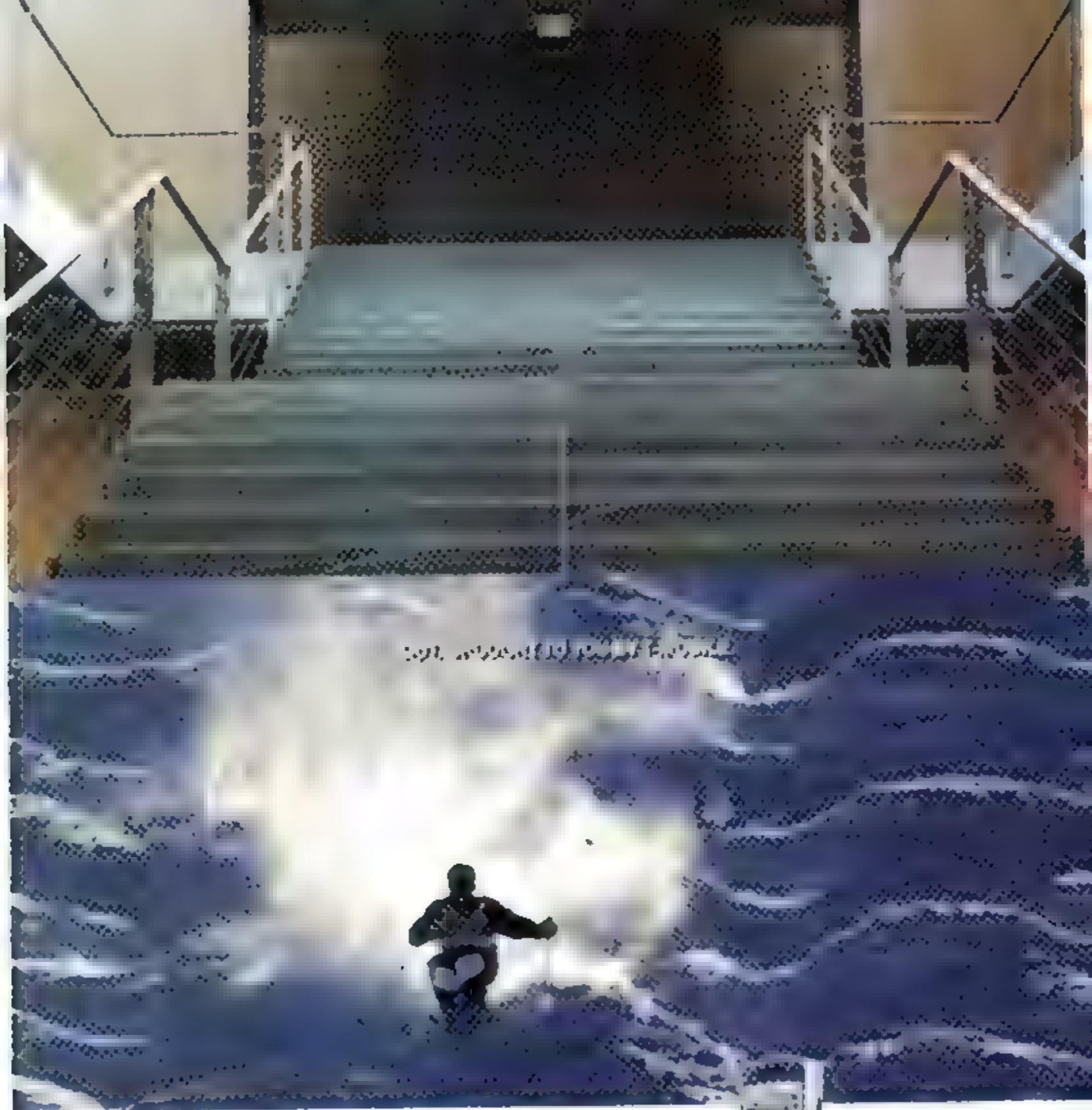
www.GODOFWARTHEGAME.COM



PlayStation 2

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... BlackBerry®. You can't get out of the office and still stay connected. BlackBerry® is unlimited BlackBerry® e-mail, instant messaging and Web browsing. To find out how you can get out and get more, go to blackberry.com.

You really should get out more.

BlackBerry



T-Mobile

WHAT THE BIG GUNS CARRY

Light Artillery

Who needs the sun when your flashlight could make Apollo himself wince? Generating a blinding 2,000 lumens, SureFire's godlike flashlight is roughly 120 times brighter than a typical D-cell model without being heavier (about 3 pounds) or bigger. It's just over a foot long. The xenon gas bulb is powered by 20 lithium batteries stowed inside the military-spec aluminum handle. With no filament and a heat-resistant Pyrex lens, it's tough enough for the JS military to mount a version of it on heavy machine guns. Better set your sights on one quickly: Only 85 will be sold to civilians. The longer you wait, the more you'll pay.

by Brian Lam

Caught Off Tape



Ditch those pesky little DV tapes without losing image clarity. JVC's point-size Evono is the first hard-drive-based digital video camera to use separate red, green, and blue CCD sensors for pro-quality color accuracy and low-light detail. The included 4-Gbyte microdrive can hold an hour of DVD-caliber footage, including Dolby Digital audio, or thousands of 5-megapixel stills. And all this pro-imaging prowess comes squeezed into a 3.2 x 2.2 x 4.7-inch shoe. **EVONO** \$500. www.jvc.com



THE MP3 PLAYER THAT ANSWERS PHONE CALLS

Bluetooth Rocks!



Put 60 Cent on hold whenever your phone rings. Pair X2S Bluetooth-enabled MP3 player with your similarly equipped cell, and it'll show you who's calling on its 1.5-inch OLED screen. If you pick up, the tone pauses the music and reroutes the phone's audio to your earbuds. Click End and the player switches back to the songs stored in its 1 gig of flash memory, or on your SD card. You'll be back "In Da Club" in no time. **MEGA PLAYR 622BT** \$249. www.x2usb.co

After 14 years and 8,197 prototypes, we had it.
A vacuum that works how it should.

It doesn't lose suction.

See how it works at www.dyson.com



dyson

ELIMINATING EMISSIONS AND

Someone should make hydrogen vehicles and their refueling stations a reality. Only GM could. General Motors has teamed up with Shell to introduce the nation's first hydrogen refueling pump at a retail station. It's the endgame of a multi-faceted strategy GM set in motion years ago to create a fleet of vehicles powered by hydrogen. Right now, a test fleet of hydrogen-powered GM vehicles

CHEVROLET

DOUBTERS.



Hydrogen fuel cells are the most advanced technology available today. They produce clean, quiet power by combining hydrogen and oxygen. No pollutants are released. No moving parts. No noise. Just pure, clean energy. And now, with the introduction of the Saturn SC Hydrogen Fuel Cell vehicle, you can experience the benefits of this revolutionary technology. The SC Hydrogen is the only car in the world that runs on hydrogen fuel cells. It's the future of transportation, and it's here now.

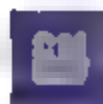
GM

SATURN

PLUMMER

AAA

Hydrogen

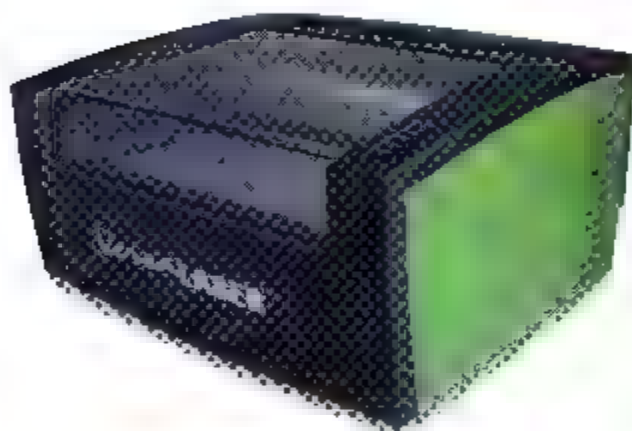


You Talk, It Types

CELLPHONE Texting is cool, but getting it to autobust 5 X. Samsung's newest cell gives your opposable as a freak. A built-in 2-megapixel camera, a business card and a snap-on built-in character-recognition software grabs the info from the screen and enters it into the address book. And when you're weary of tapping out SMS messages, just speak into the mike. The A800's voice-translator understands where you're at when you're LOL and when you GGN. A800 about \$250. www.samsung.com



OMFG! NO MORE SPELLING WITH YOUR THUMBS!



Mark Your Territory

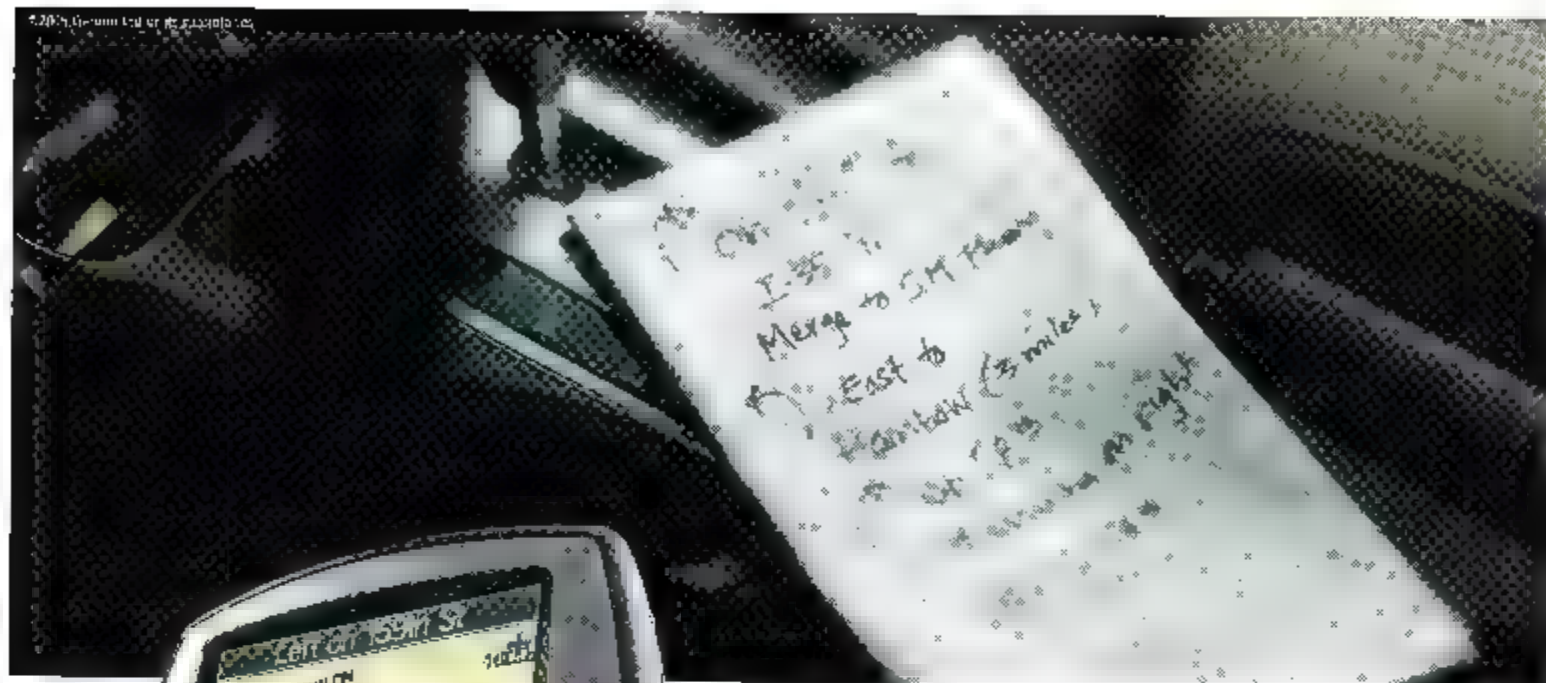
PRINTER Forget label makers and Sharpies. The versaLaser beams custom images or words into metal, marble, ceramic, glass, or stone with a 10-watt CO₂ beam. It'll even pass through wood, fabric, or plastic up to a 1/4-inch thick. PCs see it as just another USB printer, so you can tear off designs from Photoshop, Microsoft Word, or CAD software. versalaser.com \$200-\$799.50. www.versalaser.com

Raze the Roof

CAR There's nothing like driving with the roof down, the smell of fresh air, the sun on your face, the roar of 200-plus-miles-per-hour wind whapping past your head. Tearing through this Lamborghini's like riding a lightning bolt: you'll be scared and electrified (and totally soaked if it rains). A 12-cylinder, 580-horsepower engine makes it the fastest roadster on the market. Extra-strength hardtop sold separately. Miami-based Roadster \$319,250. www.lamborghini.com

GO TOPLESS AT 200 MPH

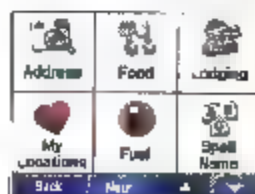




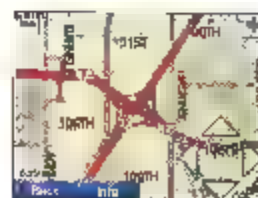
**StreetPilot® c330 –
portable, affordable car navigation.
A simple improvement on an old idea.**

It doesn't get much easier than this. The Garmin StreetPilot® c320 and c330 navigation systems offer clear, friendly driving directions. As if the easy-to-follow text prompts weren't enough, the c-series StreetPilots provide audible commands from two built-in speakers. The display is big and bright for at-a-glance guidance. Then choose 3-D perspective or overhead graphics to pinpoint where you are. Detailed maps are loaded onto removable cards for the c320 while the c330 comes pre-loaded with highly detailed MapSource® City Select® street data on the entire United States, Canada and Puerto Rico.

For simple directions to any address or any place, look to the reader in navigation. The StreetPilot c320 and StreetPilot c330 make the getting there easy. See them at www.garmin.com/StreetPilotc



Plug in an address, unplug an attraction, then enjoy directions to the finish.



The bird's-eye view shows your exact location on a detailed map.



©2004 GARMIN

'Pod My Ride

For many people, listening to an iPod on the road is a vexing affair. It often requires wrestling with a clunky cassette adapter or enduring the static of an FM transmitter. And then there's the risk of a fat-finger that comes with navigating menus while racing down the interstate. It doesn't have to be this way. Professionally installed adapters connect your iPod to your car stereo with no in-car fuss while giving you maximum control. You can play, pause, and fast-forward—and even view song details—from your dashboard. Best of all, these adapters keep your player charged and channel crisp, clear sound. **Hershe M. Brown**

WIRELESS ABOUT ADAPTERS

There are two types of hard-wired iPod adapters: ones that work with a wide range of car stereos or head units—and ones that interact only with specific, after-market brands. The former is built to accommodate existing car stereos but may not support features like text display or playlists. The latter requires that you purchase a head unit outfitted more bells and whistles.

WHAT TO LOOK FOR

- **Interface** The iPod is king among MP3 players because of its elegant user interface; a car system should at least try to match it.
- **Text display** A screen is far more helpful than track buttons that can display song information make navigation much easier.
- **Auxiliary input** Some adapters include an extra jack so you don't have to sacrifice your CD player to hook up the iPod.
- **Feature support** Being able to search by artist or album and manage multiple playlists is ideal.



Clarion VRX755VD

This do-it-all A/C station will truly pimp your ride. The head unit sports a 7-inch flip-open LCD screen that visually mimics your iPod's interface, buttons and all, so there's no need to crack the manual. Additional features such as DVD, CD, and MP3 playback, plus support for a 5.1-channel surround-sound processor, Sirius satellite radio, and a tuner all come together in one badass car stereo. Yes, you'll have to throw down a pile of dough—but once you get over the sticker shock, you'll have some serious bragging rights. There's nothing else on the road that can match this ultimate iPod accessory.

\$1,600 (includes head unit), www.clarion.com

Wicked iPod-friendly: Clarion's rich media interface

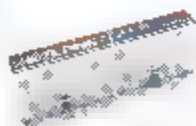
Wired expensive: Will look great in place in your car that has a factory-installed stereo



Denon ICE Link Plus

- **Wireless** Allows a wide range of stereos to control and display text from an iPod. Smooth integration, especially for German-made cars. Audi, BMW, Porsche, VW. Downloadable feature updates.
- **RF** Controls were sluggish with iPod. Play Song info doesn't display in all car stereos.

\$199 and up, www.denonusa.com



Alpine KCA-4201

- **Interface** Top-notch user experience. Navigation and information display. MediaXpander technology helps fill some gaps in digital music files. Supports optional Alpine A/V touchscreen (\$1,600).
- **RF** Works only with 2005 and select 2004 Alpine head units, which start at \$250.

\$100, www.alpine.com



Monster iCruze

- **Interface** Connects to the widest range of factory-installed head units. Optional LCD 15" DOH displays will be long into than many scrolling decks.
- **RF** Base price can nearly double for certain vehicles because some cars need more parts and connectors than others.

\$250 and up, www.monstercarstereo.com



Where did they hide all the speakers?

No drunks. No mirrors. Better yet, no extra speakers and no extra wires. Introducing the highly advanced Yamaha Digital Sound-Projector. It delivers rich multi-channel surround sound from one elegant component and is designed to fit ideally with a flat-screen TV display. Simplify your home theater. Enhance your viewing experience. And amaze your friends.

Don't get so far it's to believe it. For more information and a demonstration at a dealer near you, call 1-800-451-4242.

YAMAHA

When it comes to chores, vacuuming ranks just ahead of raking the leaves and cleaning the toilet. These chores won't eliminate a the way but, in technologies make the task suck a little less. —Cathy Li



Dyson All Floors DC14

🌀 **Wahl** Dyson's "Doesn't Lose Suction," but it works, performing well on wood and carpets. Ultra-compact and light: 19 pounds.

⚠️ **TIP:** Hard to push on thick rugs. Awkward to tilt handle

Sebo automatic X4

• **Auto Adjust** Automatically adjusts roller height for carpeting or wood floors
• **Glides** onto trim covers easily. Very light (16 pounds).

⬇ Rejected larger debris on wood. Upholstery tool sacking.



Hoover Self-Propelled Wind Tunnel Bagless U6630-900

Self-propel feature makes pushing the vac effortless. Upholstery tool could suck the hair off a cat.

🕒 **T. R.F.L.** Had trouble with chips and
 C. Leg. as in the pic. Weigh is 22 pounds



Eureka Bo&B 4D 5902BVZ

Built in electrostatically charged dust collector for cleaning table tops, blinds, and shelves. inexpensive.

Ⓢ 718FD Performed poorly on both carpets and floors. Opening dust cup and released a cloud of dirt. 25 pounds.

8430 WWW.COVSON.COM

\$699. www.sdp-vacuum.com

5390 WWW.HOUSE.COM

\$200, www.careka.com

Rapper's Delight

Waving your hands, like a rock you just don't care can get your luck & several big-time rap stars concocted energy drinks to keep you going on and on till the break of dawn. **Eric Steuer**



Lil Jon's Crunk!!

☞ **Blind of ashwagandha**
honey-goat head, and caffeine really
delivers. Fresh pomegranate flavor

🔊 T.J. • E.L. Get ready for a sleepless night, 'co wonder Jason always seems so amped. WHAT?!! OK. YEA YA.



Ice-T's Liquid Ice

🍷 Pleasantly long-lasting pick-me-up. Super sweet. Lightly carbonated. Goes well with yucka.

🕒 **1 hr 15 min** Tastes like a melted Otter Pops. Bright & lite color not keeping it tea unless you're a Crip, of course.



Nelly's PimpJuice

No. 10 can Non-irradiated Mellow
tropical flavor. No aftertaste. Contains
10 percent actual fruit juice.

Not much per. Packs
140 calories 20 more than Dunk
and 0 more than food, i.e.



Russell Simmons' DefCon3

☛ Each can is filled with 10 ounces of liquid upper vers 5 the other brands totaling 8 Only 45 calories per serving

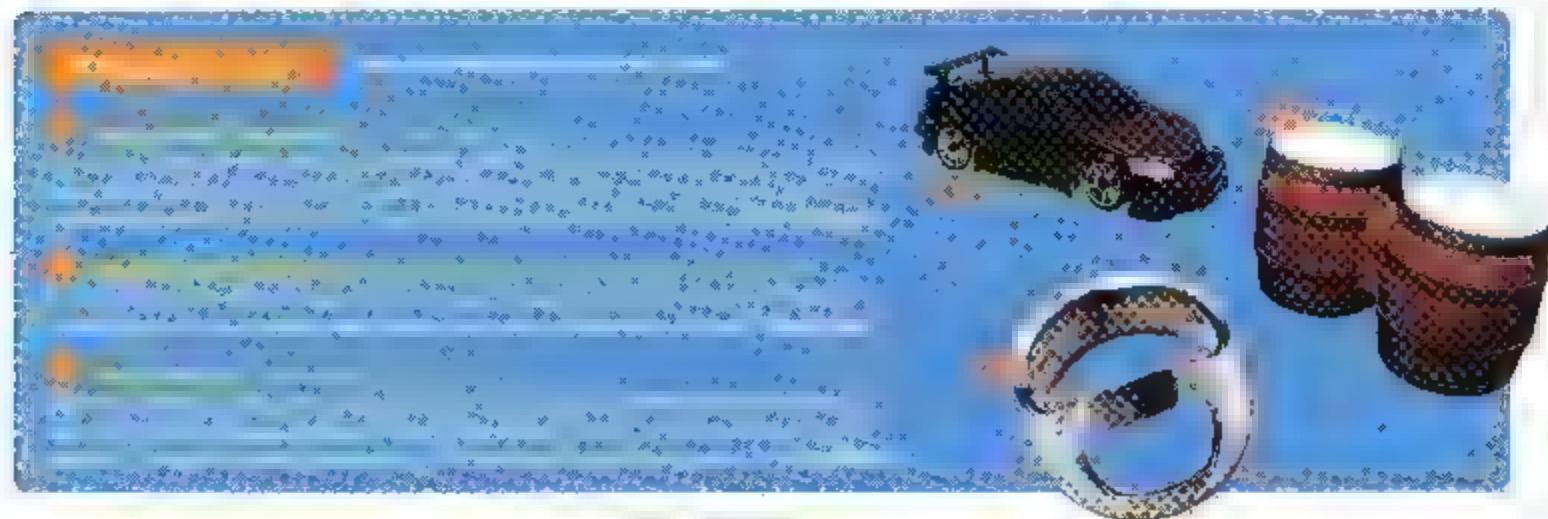
Too fizzy. Yielded only a mild rust

52. www.chundranigdydink.com

32 www.liquidbioenergylink.com

\$2, www.centrilose.com

52. www.dedicon3.com

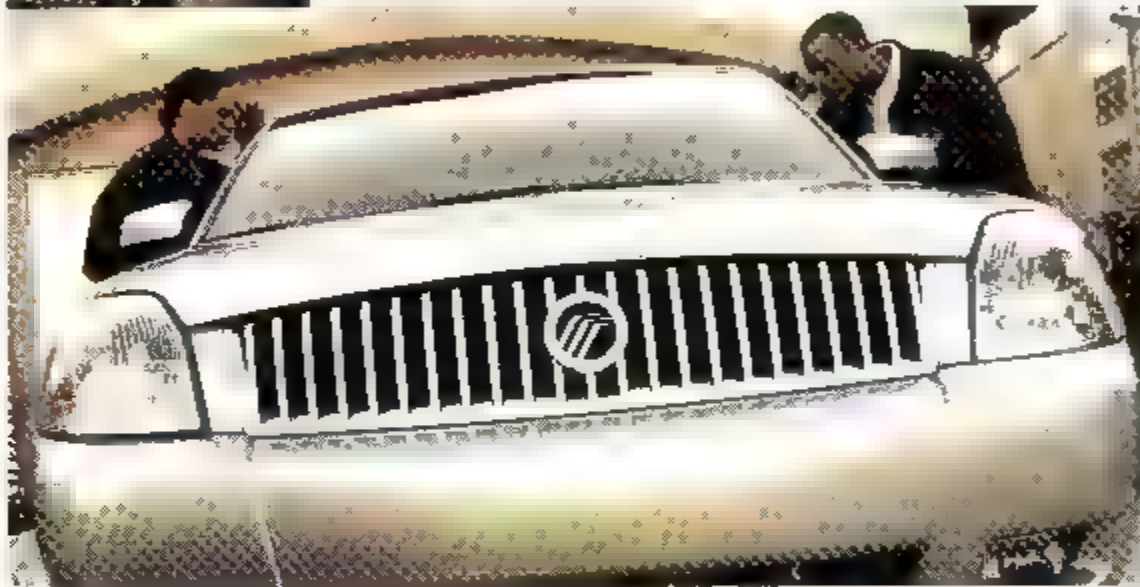


A MUSIC REVOLUTION. NO STRINGS ATTACHED.

OAKLEY THUMP™ is the world's first digital audio eyewear. The entire music system is built inside a precision optical frame. No more wires or cords that dangle and tangle. Just acoustically pure sound from a 75MHz Digital Signal Processor. Plus flip-up lenses with patented optics and optional polarization. Experience real music freedom with no strings attached. To find an authorized dealer near you call us at 1-800-501-5880 or log onto oakley.com/thump



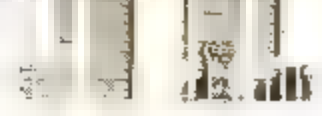
PAUL'S NEW MONTEGO PROVED to be a distraction for the Neighborhood Watch group. Meanwhile, the Elm Street lawn ornament abduction would slip under their radar.



Introducing Mercury Montego.

It was Montego's expressive lines that first caught their attention.

On closer inspection, the 5-passenger sedan revealed its distinctive details—a cavernous interior, elevated Command Seating™ for maximum visibility, and an abundance of rich leather trim.* "Anything wrong, officers?" Paul asked. "On the contrary," they replied.



MERCURY NEW DOORS OPENED

A visit to a dealership.

Mercuryvehicles.com

D trackback

Hey, China - Invent Your Own Freakin' Internet!

China is objecting again to the disproportionate influence the United States entities have in the operation of the Internet. If the Chinese are unhappy with the free exchange of information they can just build themselves a Great Firewall of China and do whatever they want. **»**

Posted on [memefirst.com](#)

Robert S. Engineering marketing consultant, K-Town Group

Email Addresses It Would Be Really Annoying to Give Out Over the Phone

• mikeunderscore2004@yahoo.com
• mikeatyahooordoccom@hotmail.com
• paqwinhat@saxaa@yahoo.com

From *Created in Darkness by Troubled Americans, The Best of McSweeney's Humor Category*
Michael Ward writes

Why I Don't Entirely Hate Online Viral Marketing

A though most sentient beings think of advertising as predominantly evil, or if forgiving, necessarily evil, viral marketing introduces complex issues about how we relate to media, how we want to believe in fantasy and how we still cling to the notion of authenticity. Sometimes it's strangely addicting. [subscriber to broken.com](#), and other times it's like watching your parents decide to Outkast [ragingnow.blogspot.com](#). **»**

Posted on [fimoculous.com](#)

Rex Sorgetz, interactive director, Internet Broadcasting Systems

Splice It Yourself

Who needs a geneticist? Build your own DNA lab.

BY ROB CARLSON

The era of garage biology is upon us. Want to participate? Take a moment to buy yourself a molecular biology lab on eBay. A mere \$1,000 will get you a set

of precision pipettors for handling liquids and an electrophoresis rig for analyzing DNA. Side trips to sites like BestUse and LabX (two of my favorites) may be required to round out your purchases with graduated cylinders or a PCR thermocycler for amplifying DNA. If you can't afford a particular gizmo, just wait six months: the supply of used laboratory gear on eBay gets better with time. Links to sought-after reagents and protocols can be found at DNAHack. And, of course, Google is no end of help.

Still, don't expect to cure cancer right away, surprise your loved ones with a stylish new feather goatee, or crank out a devilish Frankenbug. Instant bioterrorism is likely beyond your reach, too. The goodies you buy online require practice to use properly. The necessary skills may be acquired through trial and error studying online curricula, or taking a lab course at a community college. Although there are cookbook recipes for procedures to purify DNA or insert it into a bacterium, bench biology isn't easy; the many molecular manipulations required to play with genes demand real skills.

Science, after all, involves doing things no one has done before, and it most often requires developing new art. But art can

be learned and more important, this kind of art can be taught to robots. They excel at repetitive tasks requiring consistent precision, and an online search will uncover a wide variety of automation tools for sale. For a few hundred to a few thousand dollars, you can purchase boxy-looking robots with spindly arms that handle plates of samples, mix and distribute reagents, and make a fine martini. Some of the units are sophisticated enough that you can teach them a bit the new tricks published in fancy journals, just make sure you have plenty of electrical outlets.

That said, actually manipulating a genome with your new tools requires learning something about software that helps design gene sequences. These bioinformatics programs are all over the Web, and in no time you'll be tweaking genome sequences on your computer are into the night. But while you may discover some interesting relationships between organisms, and with access to the right databases you may even find a connection between a mutation and a disease, no mean contribution, to be sure, the real work gets done at the lab bench.

If you want to get down and dirty

✦ **bash** ng DNA, order genetic parts suitable for use in *E. coli* from the synthetic biology group at MIT available soon. These genes constitute a library of defined components that can be assembled into control systems for biological computation or used to program bacteria in order to produce interesting proteins and other compounds. There's even an online design tool for genetic circuits. If you're more into hacking plants—perhaps you want true plastic fruit growing on your tomato vine or apple tree—head to BioForge where you can get expert info.

Concern that these resources can be used intentionally to create hazardous organisms is overblown. Relatively few labs possess all the necessary equipment for the task. Despite the recent demonstration of working viruses constructed from man-made DNA, repeating those feats would be difficult.

Yet it's getting easier to synthesize whole genomes, particularly if your arms aren't sinister. Instead of trying to assemble a viral or bacterial genome yourself, you can order the whole sequence online from Blue Heron Biotechnology where researchers will first check it for genes in known pathogens and toxins, and then, two to four weeks later, FedEx you the DNA. A few

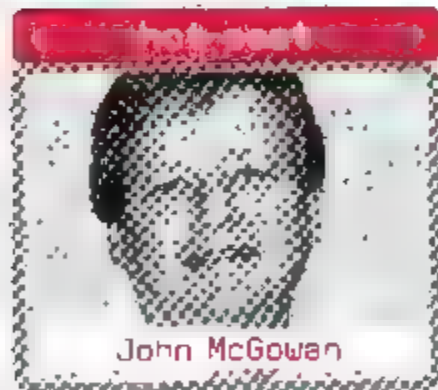
thousand dollars will buy a couple of genes enough for a simple control circuit, soon it will buy most of a bacteria genome. And your Synthetic Biology@Home project will get easier when microfluidic DNA synthesizers hit the market. These have already been used to write sequences equivalent in size to small bacteria genomes, a capability currently limited to a few academic and industrial labs—but not for much longer.

The advent of garage biology is at hand. Skills and technology are proliferating and the synthesis and manipulation of genomes are no longer confined to ivory towers. The technology has even reached the toy market. The Discovery DNA Explorer kit for kids 10 and older (see *Wired*, issue 11/12) is surprisingly functional at \$80 and how long will it be before we see a Slashdot story about a Lego Mindstorms laboratory robot?

Sure, few high school students will be able to pay for this equipment with the earnings from Mickey D's, but anyone who spends a few thousand cars, boats, or computers can get to work hacking biology tomorrow.

Rob Carlson, carlson@ee.washington.edu, is a senior scientist in the Department of Electrical Engineering at the University of Washington.

GET E. COLI DELIVERED TO YOUR DOORSTEP!



John McGowan

Which is the bigger threat, biothreat or bioterror scenarios that make for gripping plots in Z or diseases like AIDS that actually kill millions each year? In an opinion letter to the *National Institutes of Health*, 750 microbiologists assert that since 9/11, biodefense projects have drained money from the basic infectious-disease research needed to fight existing epidemics. So *Wired* asked John McGowan, the man who allocates NIH funds for both, whether public health is a casualty of the war on terror. — **Lucas Graves**

Is Biodefense a Health Threat?

WIRED Is the National Institutes of Health pursuing exotic biodefense threats at the expense of basic research into everyday epidemics?

McGOWAN After September 11, there was a debate on who would get the money to develop new drugs and vaccines for countermeasures to bioterrorist threats, and we stepped up. That was new money; it didn't take money from existing research programs for public health. In fact, just the opposite occurred. I've sent you the numbers.

You sent one department's allocations. The Sunshine Project's public data shows anthrax funding up 2,388 percent since 1999. HIV and TB are down 20 percent.

That's such bad data. They don't understand the complexities of what they're trying to analyze. They are using data that wasn't designed for that purpose. There are internal numbers that are much more sophisticated than what's available to the public.

These PhDs are pretty f---ed up. Are you saying it's because they can't read a budget?

I don't know that they are as f---ed up as you think. Sometimes it's easy to sign a petition without knowing all the information related to it and how the originalators intend to use it.

Regardless, the sentiment—that we should be putting more of the biodefense budget into basic research that can yield big payoffs—is widely held. What do you think?

That's an appropriate debate, but it should be brought up through representatives to the Congress and to the president. Why do you still do public polio vaccinations when there's been no polio in the United States for years? Why do you have a military infrastructure when you don't have a war? It's not really a science debate.

Voice-Over-IP's Unlikely Hero

On his way out, Michael Powell defends four fundamental freedoms of the Net.

BY LAWRENCE LESSIG

The first shot in the Internet's most important war was fired this March. Almost faster than a speeding bullet, the FCC stopped Madison River, a DSL service provider for the Southeast and Midwest, from denying its customers use of Vonage's voice-over-IP service. Vonage had given the FCC evidence that Madison was

blocking access to critical ports—a breach of network neutrality. In his final days as the commission's chair, Michael Powell ordered his enforcement department to move quickly without hearings or the involvement of any other commissioner. Madison was charged with violating a nondiscrimination principle the FCC found buried within federal statutes. The company backed down. And thus, with a single surgical strike, the first proven case of a broadband provider violating the principle of network neutrality was over.

VoIP is emerging as the Internet's newest "killer app"—one that not only explodes demand for broadband but effectively renders obsolete its major competitor, plain old telephone service. The last such killer app—the original Napster—didn't fare as well with federal regulators. In that case, courts were quick to protect the music industry from a business that wanted a free ride on the tube's investment. This time, regulators sided with the free riders. Vonage and other VoIP startups, AT&T didn't have a lobbyist like Jack Valenti to convince us that its monopoly was just "property." So regulators happily embraced new technologies that lowered the cost of telephone service whatever the cost to telcos.

Of course, many people had thought they'd never see the day that Powell would

actually defend network freedom. When he warned providers everywhere that their violation would incur his wrath, they said the threat was hollow. Powell proved them wrong. There was neither wavering nor further warning. There was simply enforcement of this pro-innovation principle.

Yet it's too soon to say that the Internet has been made safe for network competition. Now that Powell is gone and Kevin Martin has been appointed chair, it's important to note that the nondiscrimination principle in telecommunications law that Powell acted upon applies to telcos, not cable companies. Had Madison River been Madison Cable, Powell's pistol would never have left its holster. Powell was lucky. The principle of network neutrality was lucky. But luck alone won't win this war.

Powell was a controversial leader. He didn't back away from unpopular positions or spend his time gauging how popular his positions would be within the industries he regulated. I'm not a fan of everything he did, but I am a fan of this action. And because strength of character in Washington deserves special kudos, Congress should reward his by embedding Powell's insights into the fundamental laws governing the Internet.

Call it the Powell Doctrine and let it be embodied at the same level of generality that he outlined more than a year ago:

Internet service providers must guarantee their customers four freedoms: 1) the freedom to access legal content; 2) the freedom to use the legal applications of their choice; (3) the freedom to attach personal devices; and (4) the freedom to obtain meaningful service and information. These freedoms together produce a kind of network neutrality. ISPs that violate this neutrality should do so at their peril.

Powell's aim was to use his threat to steer businesses away from activities that corrupt the core values of neutrality built into the Internet. But that threat now needs a more reliable defense. While the crudest techniques, such as port blocking, may be gone, plenty of more-subtle techniques could be adopted by an ISP to tilt the network to its advantage. And again, if that ISP is a cable company, the risk under the current regime is not going to be small.

This administration has done little to push broadband in the U.S. Its attention has understandably been elsewhere. But we could forgive a neglect if it made permanent the insight that the former FCC chair made real: The competition that works best to inspire innovation is competition to provide better service, not competition to find clever ways to sabotage the business of competitors. *Email: Lawrence Lessig at lawrence@lessig.com or @wiredmag.com*

First Aid for Health Care

A few radical inventors could wreck America's dysfunctional medical system.

BY BRUCE STERLING

Behold the disruptive innovation! An entire industry can putter along for decades, steadily improving its products, services, and bottom line – only to be suddenly eviscerated by people from nowhere using simple, inexpensive, profoundly

powerful techniques. Disruptors start by serving people whom established players don't even recognize as customers. Eventually, the newcomers learn so much so quickly that they can't help but radically outperform the incumbents. Take the phonograph: Thomas Edison installed his invention in the heads of dolls before it suddenly made saucer pianists and theatrical orchestras obsolete.

Harvard Business School guru Clayton M. Christensen has described this theory of industrial extinction in several books, in his latest, *Seeing What's Next: Using Theories of Innovation to Predict Industry Change*, the author encourages readers to spot vulnerable areas in the processes, values, and markets of seemingly invulnerable industries.

Intrigued by this challenge, I searched for the stupider, most dysfunctional U.S. industry I could find. The automotive and energy industries, beset by entrenched interests, sclerotic management, and shifting oversight, were tempting. But the worst has to be health care. Health care has every quality Christensen lists as dangerous: crippling regulation, overcharged customers, enraged victims with deep grudges, unnecessary goods and services, and a massive base of underserved wretches. The remarkably unhealthy U.S. population blows more money on medicine than any other nation in the world, yet gets sicker anyhow.

Could a radically inventive disruption somehow render the whole a gaudy mess irrelevant? A system that eats 15 percent of the U.S. gross national product is a

broad field for disruptions. Some might bite a few ticks off the value chain, while others have potential to wreck the whole (physician-led) shabang. Let's consider a few scenarios.

Medical tourism takes off. U.S. patients rave online, from country for everything short of visits to the emergency room. Offshore docs offer medical services that are faster, cheaper, and safer than anything available at home, obviating U.S. doctors, clinics, pharmacists, insurers, and the federal government's list about everything.

How likely is this? Medical tourism is already flourishing. Thailand is the golden shore for wealthy sickly Asians and Aussie-ang. Fashionable Europeans head to South Africa for embarrassing plastic surgery. Crowds of scrip-waving Americans buy prescription drugs in Canada and Mexico.

Alternative medicine gets serious. Health food stores move out of the feel-good biz and focus on efficacy and marketing. Vitamin shops partner with massage therapists, acupuncturists, herbalists, dietitians, and physical trainers. Chiropractic operations collaborate with paramedics, nurse practitioners, and midwives. Together they crack the jaw-hanging, full-cassia doctor visits and innocuous prescription medicines.

Could it happen? Alt-med storefronts are everywhere, primed for walk-in traffic. Their customers have never trusted the medical establishment anyway.

Diagnostix "R" Us. Newfangled clinics offer a galaxy of cheap, simple diagnostic tests that show people what's going on in

their own bodies. Counselors dispense information support, interpretation, and follow-up advice. Under a lack of an effective popular alternative, the absurdly expensive, often unnecessary, lab test machine withers.

This disruption is well under way. Over-the-counter tests now cover pregnancy, cholesterol, blood glucose, blood pressure, AIDS, narcotics use, and pollutant load. Meanwhile, walk-in, pay-at-clinic offer MR and CT full-body screening for the masses. It wouldn't take a genius to tear off this chunk of the medical complex and commoditize it.

Oldsters join the extropians. Aging boomers flock to longevity spas, which dispense radical rejuvenation procedures in the guise of elder care. The neglected elderly embrace biotech research considered outré by mainstream medicine: gene therapy, stem-cell-driven organ regeneration, designer drugs that restrict caloric intake. Abandoned by their best customers, GPs and gerontologists close the books and go home.

What are the prospects? Sure, this notion would create a playground for trashhumanists and life-extension quacks. But efficacy is moot: the looming elder population has little to lose and is too weak to sue with much enthusiasm. If zealots can deliver even vaguely effective anti-aging treatments to desperate elders, they could have a huge impact on the system. And some of us might even live longer, better, and with more money in our pockets.

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Think Bolligeront

Steve Jobs will do anything to protect his precious secrets. So he's suing Apple's biggest fans. Inside the Mac daddy's battle with the rumor blogs.

is the kind of guy Apple is supposed to love. At age 8, he began using his parents' Mac Classic and quickly became a zealot. At 13, he launched a Web site devoted to all things Apple, especially upcoming product releases. Now 18, Ciarelli has turned the site, Think Secret, into a must-

read for true Apple fans. Few suspect that the person writing so authoritatively under the name Neck dePlume wasn't even born when the Macintosh was introduced. Young, a bit brash and not afraid to think different, Ciarelli has become a personification of Apple itself.

So why is the company trying to squash

him? In the weeks leading up to this year's Macworld Expo in San Francisco, Think Secret published a string of announcements about forthcoming Apple products. Ciarelli predicted the debut of the Mac mini, a sub-\$500 headless Mac. He also anticipated the launch of the iPod shuffle and of iLife '06 with GarageBand 2.

Think Secret was it turns out right about all three. Apple, led by hyper-controlling chief executive Steve Jobs, congratulated Ciarelli by faxing him a 18-page lawsuit *Apple Computer Inc. v. Nick dePiume*. The suit alleges that Ciarelli violated the Uniform Trade Secrets Act by soliciting information from sources inside Apple and posting it on his site. Apple demanded that Ciarelli pay damages and hand over his profits.

The company has also hit Think Secret and two other enthusiast sites, PowerPage.org and AppleInsider, with a separate suit filed to obtain the identities of the people who were leaking product information. In March, a California Superior Court judge ruled that the sites had no right to protect their sources or withhold unpublished material. The Electronic Frontier Foundation has stepped in to appeal the ruling, arguing that online journalists have the same right to protect sources as traditional journalists do.

Until the suits were filed, Apple seemed to be enjoying a symbiotic relationship with Ciarelli and his peers. The obsessed fans

and it triggered coverage not only of the forthcoming Mac mini and the iPod shuffle but also of Jobs' keynote. Two months later, news about the lawsuit was still showing up on the front page of the *Times* and *The Wall Street Journal*. "Usually a rumor like this is good news for a company because you get the story twice," says Gary Fine, a sociology professor at Northwestern University and coauthor of *Rumor and Gossip: The Social Psychology of Hearsay*. "You get the rumor about the new product and then you get the official announcement. But in this case, maybe Apple wanted to get the story three times: the rumor, the lawsuit, and then the announcement."

Even if publicity was the real motivation behind Apple's legal maneuvers, the company is not, of course, owing up to it. Apple won't comment on the lawsuits at all, except in a statement asserting that the defendants "stole our trade secrets and posted detailed information about an unannounced Apple product on the Internet. The protection of our trade secrets is crucial to our success."

rushed outside and forced them to delete their photos.

This control freak impulse comes straight from the top. Chief executives of major companies have just so much time for the media, no matter how much they value the power of publicity. But Jobs is unique in the way he manages external communications. He rarely grants interviews or sits for photographs. When he does talk, all discussion leads back to the product he's promoting. And when he grants a photo shoot, it's with the Apple product in hand.

Ever since Jobs returned to Apple in 1997, the company has used the threat of lawsuits to try to stop magazines like *MacWeek* from publishing tip sheets and product speculation columns. If the control fetish has reached new heights with a war on the company's biggest fans, that's because, from Apple's viewpoint, there is no other option. Computer trade glossaries are always weighing the benefits of printing inside information against the threat of losing access to Apple or its ads. "We don't do rumors," says

CIARELLI COULDN'T WAIT TO SEE WHAT APPLE DID NEXT HIS REWARD: A 18-PAGE LAWSUIT.

would dole out any scrap of inside dope they could gather, and Apple, in turn, would benefit from the intrigue and publicity generated. But the lawsuits sent a clear message: Apple wanted out. "I still love Apple products," says Ciarelli, now a freshman at Harvard, where he runs Think Secret out of his dorm. "That hasn't changed. But obviously, I wish I weren't involved in a lawsuit. The techniques I use to gather information are legal. This wouldn't be happening to *The New York Times*."

That's because the *Times*, along with other major news organizations, is unlikely to be intimidated by Apple's muscle. And Jobs knows that he needs the mainstream media to wage his remarkably effective publicity campaigns. In fact, Apple's crackdown on three obscure enthusiast sites may well have less to do with protecting trade secrets and more to do with creating buzz.

Viewed in that light, the lawsuits have already been a success. Apple filed against Ciarelli on January 4, seven days before the products he wrote about were formally announced. It was a tacit admission that Think Secret's information was largely accurate

It's true that any company in a cutthroat business needs to keep a tight lid on product rollout schedules. But Think Secret's scoop about the Mac mini gave rivals a mere week's notice—hardly time to gin up a press release, much less a competing product. What's more, the news wasn't exactly shocking. "We have tons of examples of people speculating about a headless Mac as far back as 2003," says Terry Gross, a San Francisco attorney who's representing Ciarelli. "So I'm not sure how they can say that's a trade secret. This lawsuit is really about intimidation."

That's a word that has become synonymous with Apple, where the urge to clamp down on information sometimes borders on paranoia. Employees must sign nondisclosure agreements, job interviewees aren't allowed to visit the rest room unaccompanied lest they get a glimpse of something unauthorized. In January, when bloggers from an enthusiast site stood outside San Francisco's Moscone Center and photographed LIFE IS RANDOM posters 48 hours before the phrase was to become the iPod shuffle's ubiquitous tagline, an Apple crew

Macworld editor in chief Jason Snell. "There's a benefit to having a good relationship with Apple; they're more open to media outlets that play ball." But the enthusiast sites don't get interviews with company officials or Apple advertising revenue, so they have few disincentives to publish speculation. As a result, Apple has turned to its last resort—the courts.

There's a risk, of course, in taking a swipe at the Apple zealots. "I've done nothing but create community for Apple, and this is what I get," laments Jason O'Grady, who has run PowerPage.org since 1995. "The shine has come off Apple for me."

Running a tightly controlled company has worked well for Jobs. But being a little out of control can pay dividends, too, by fostering creative freedom, not to mention goodwill. Jobs need only look at his own slogans: Life Is Random. Enjoy Uncertainty. At Apple, this is marketing, not a way of life. ■ ■ ■

Contributing editor Tom McNichol (mcnichol@pacbell.net) wrote about traffic engineering in issue 12.12.

Car tech

In the past, "aftermarket add-on" meant a pair of fuzzy dice. These days, consumers can customize their ride with a number of high-tech options that make driving safer and more hassle-free.

GPS technology has been around since the late 1970s, though its presence in automobiles is still relatively new. Several automakers offer built-in systems, but the cost can be prohibitive for most.

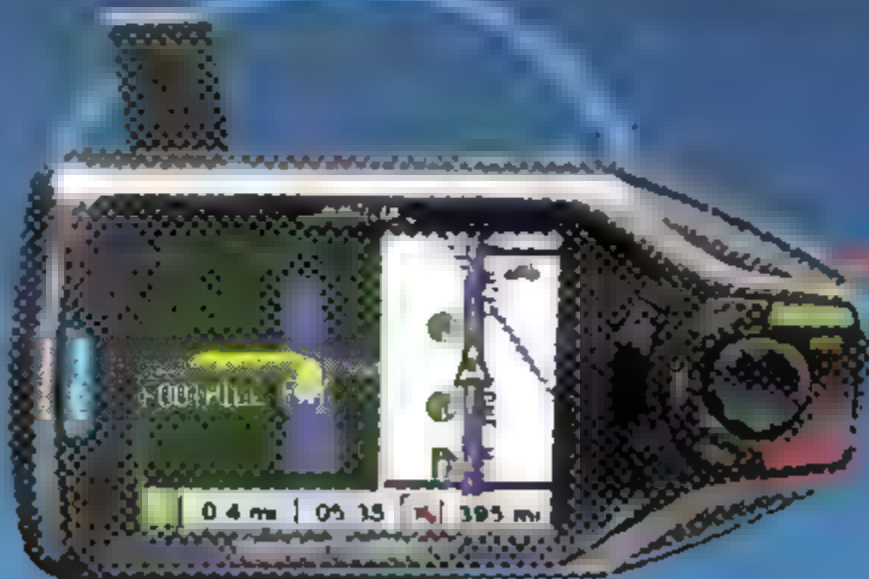
Portable GPS systems are an increasingly popular alternative and can be had for a fraction of the cost. In addition to the map and turn-by-turn directions now considered standard, today's GPS

receivers can hunt down ATMs, create custom itineraries and even find addresses with very little to go on. All of which is great if you're lost on the way to a business meeting and the directions are back in your office.

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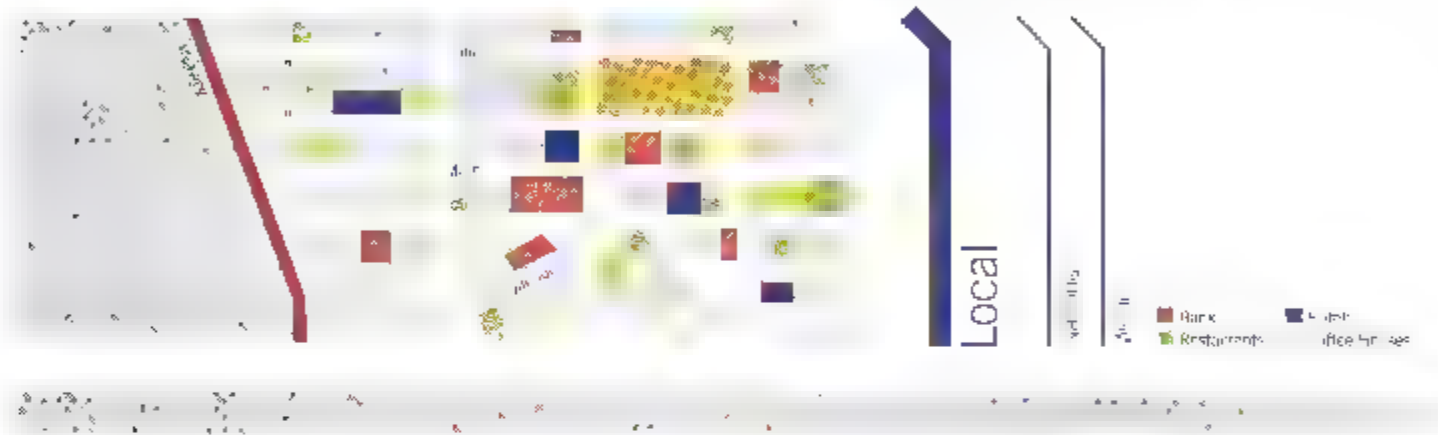
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TECH INNOVATIONS

The Internet Small Businesses Increasingly in the Driver's Seat



Globalization has been the buzzword of the late 20th century for the past few years. And no wonder. Among other trends, the Web has given corporate giants the ability to sell products and services anywhere in the world and "virtually" manage multiple markets. But it's also starting to give the little guys a leg up.

Until recently, the Internet has been a global megamall dominated by massive multinational corporations. Smaller firms simply have had access to the services they need to help them compete. Now, as the Internet's everywhere, the concept of a local business seems almost meaningless online. The Internet gave extraordinary advantage to deep-pocketed conglomerates with big bucks to spend on building Web sites, purchasing Web advertising, and capturing Web traffic.

But those rules of engagement have been changing. The Internet's becoming increasingly provided for big businesses. And affordable services are now available for small to medium-sized businesses that allow them to reach customers in their local markets through keyword advertising and optimization. Suddenly, the Web has become not just a window onto the world but also a convenient way to locate and penetrate local businesses.

As a result, the Web is creating unparalleled opportunities for smaller firms, who suddenly find themselves with a home-court advantage. The competition no longer resides in a corporate headquarters thousands of miles away, but is often the storefront down the street, according to Peter Chambers, CEO of Affinity Inter-

net, which provides a full suite of online marketing services to small businesses across the country. "Local businesses need not be as elaborate as those of global firms, but they must be compelling and useful to site visitors. Whether that means selling products online, publishing helpful tips, or providing clear directions to an office or storefront depends on the individual business," he explains.

Small businesses that move quickly will experience rapid growth over the next few years

However, it takes special expertise to leverage the new search technology to make Web ads that can attract a targeted, local customer base. "When you're located in Peoria, you can't get traffic from Zimbabwe," quips Chambers. He notes that Affinity's most effective marketing services include traffic searching, On-Page Optimizer, and Banner Builder, all help small to medium-sized businesses bootstrap a profitable Web presence. "The localized Web is a phenomenon that gives smaller firms the opportunity to tap the Internet's full potential as a business tool," he says. "Small businesses that move quickly will be able to maximize the power of the Internet and experience rapid growth over the next few years."

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Dome Improvement

Pop quiz: Why are IQ test scores rising around the globe? (Hint: Stop reading the great authors and start playing Grand Theft Auto.)

by Steven Johnson

Twenty-three years ago, an American philosophy professor named James Flynn discovered a remarkable trend: Average IQ scores in every industrialized country on the planet had been increasing steadily for decades. Despite concerns about the dumbing-down of society—the falling

schools, the garbage on TV, the decline of reading—the overall population was getting smarter. And the climb has continued, with more recent studies showing that the rate of IQ increase is accelerating. Next to global warming and Moore's law, the so-called Flynn effect may be the most revealing line

on the increasingly crowded chart of modern life, and it's an especially hopeful one. We still have plenty of problems to solve, but at least there's one consolation: Our brains are getting better at problem-solving.

Unless you happen to think the very notion of IQ is bunk. Anyone who has read

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Stephen Jay Gould's *The Mismeasure of Man* or Howard Gardner's work on multiple intelligences or any critique of *The Bell Curve* is liable to dismiss IQ as merely phrenology updated, a pseudoscience fronting for a host of racist and elitist ideologies that dare not speak their names.

These critics attack IQ itself – or, more precisely, what intelligence scholar Arthur Jensen called *g*, a measure of underlying “general” intelligence. Psychometricians measure *g* by performing a factor analysis of multiple intelligence tests and extracting a pattern of correlation between the measurements (IQ is just one yardstick). Someone with greater general intelligence than average should perform better on a range of different tests.

Unlike some skeptics, James Flynn didn't just dismiss *g* as statistical tap dancing. He accepted that something real was being measured, but he came to believe that it should be viewed along another axis: time. You can't just take a snapshot of *g* at one moment and make sense of it, Flynn says

and Jensen, that posited an environmental – not genetic – explanation for the black-white IQ gap. After finishing the book, Flynn decided that he would look for evidence that blacks were gaining on whites as their access to education increased, and so he began studying US military records, since every incoming member of the armed forces takes an IQ test.

Sure enough, he found that blacks were making modest gains on whites in intelligence tests, confirming his environmental explanation. But something else in the data caught his eye. Every decade or so, the testing companies would generate new tests and re-normalize them so that the average score was 100. To make sure that the new exams were in sync with previous ones, they'd have a batch of students take both tests. They were simply trying to confirm that someone who tested above average on the new version would perform above average on the old, and in fact, the results confirmed that correlation. But the data also brought to light another pattern, one that the



“THE HERITABILITY STUDIES WEREN'T WRONG. WE JUST MISINTERPRETED THEM.”

You have to track its evolution. He did just that. Suddenly, *g* became much more than a measure of mental ability. It revealed the rising trend line in intelligence test scores. And that, in turn, suggested that something in the environment – some social or cultural force – was driving the trend.

Significant intellectual breakthroughs to paraphrase the John Lennon song, are what happen when you're busy making other plans. So it was with Flynn and his effect. He left the US in the early 1960s to teach moral philosophy at the University of Otago in New Zealand. In the late '70s, he began exploring the intellectual underpinnings of racist ideologies. And I thought, Oh, I can do a bit about the IQ controversies,” he says. “And then I saw that Arthur Jensen, a scholar of high repute, actually thought that blacks on average were genetically inferior – which was quite a shock. I should say that Jensen was beyond reproach; he's certainly not a racist. And so I thought, I'd better look into this.

This inquiry led to a 1980 book, *Race, IQ*

and testing companies ignored. “Every time kids took the new and the old tests, they did better on the old ones,” Flynn says. “I thought: That's weird.”

The testing companies had published the comparative data almost as an afterthought. “It didn't seem to strike them as interesting that the kids were always doing better on the earlier test,” he says. But I was new to the area.” He sent his data to the *Harvard Educational Review*, which dismissed the paper for its small sample size. And so Flynn dug up every study that had ever been done in the US where the same subjects took a new and an old version of an IQ test. “And lo and behold, when you examined that huge collection of data, it revealed a 14-point gain between 1932 and 1976.” According to Flynn's numbers, if someone testing in the top .18 percent the year FDR was elected were to time-travel to the middle of the Carter administration, he would score at the 90th percentile.

When Flynn finally published his work in 1984, Jensen objected that Flynn's numbers were drawing on tests that

reflected educational background. He predicted that the Flynn effect would disappear if one were to look at tests – like the Raven Progressive Matrices – that give a closer approximation of *g* by measuring abstract reasoning and pattern recognition and eliminating language altogether. And so Flynn dutifully collected IQ data from all over the world. All of it showed dramatic increases. “The biggest of all were on Ravens,” Flynn reports with a hint of glee still in his voice.

The trend Flynn discovered in the mid-'80s has been investigated extensively, and there's little doubt he's right. In fact, the Flynn effect is accelerating: US test takers gained .7 IQ points between 1947 and 2001. The annual gain from 1947 through 1972 was 0.31 IQ point, but by the '90s it had crept up to 0.36.

Though the Flynn effect is now widely accepted, its existence has in turn raised new questions. The most fundamental: Why are measures of intelligence going up? The phenomenon would seem to make no sense

in light of the evidence that *g* is largely an inherited trait. We're certainly not evolving that quickly.

The classic heritability research paradigm is the twin adoption study. Look at IQ scores for thousands of individuals with various forms of shared genes and environments and hunt for correlations. This is the sort of chart you get, with .00 being a perfect match and 0 pure randomness:

The same person tested twice	87
Identical twins raised together	86
Identical twins raised apart	78
Fraternal twins raised together	65
Biological siblings	47
Parents and children living together	40
Parents and children living apart	31
Adopted children living together	0
Unrelated people living apart	0

After analyzing these shifting ratios of shared genes and the environment for several decades, the consensus grew, in the '90s, that heritability for IQ was around 0.6—or about 60 percent. The two most powerful indications of this are at the top and bottom of the chart. Identical twins

raised in different environments have IQs almost as similar to each other as the same person tested twice, while adopted children living together—shared environment, but no shared genes—show no correlation. When you look at a chart like that, the evidence for significant heritability looks undeniable.

Four years ago, Flynn and William Dickens, a Brookings Institution economist, proposed another explanation, one made apparent to them by the Flynn effect. Imagine "somebody who starts out with a tiny little physiological advantage. He's just a bit taller than his friends," Dickens says. "That person is going to be just a bit better at basketball." Thanks to this minor height advantage, he tends to enjoy pickup basketball games. He goes on to play in high school, where he gets excellent coaching and accumulates more experience and skill. "And that sets up a cycle that could say, take him all the way to the NBA," Dickens says.

Now imagine this person has an identical twin raised separately. He, too, will share the height advantage, and so be more likely to find his way into the same cycle. And when some imagined basketball geneticist surveys

the data at the end of that cycle, he'll report that two identical twins raised apart share an off-the-charts ability at basketball. "If you did a genetic analysis, you'd say, 'Well, this guy had a gene that made him a better basketball player,'" Dickens says. "But the fact is, that gene is making him 1 percent better, and the other 99 percent is that because he's slightly taller, he got all this environmental support." And what goes for basketball goes for intelligence: Small genetic differences get picked up and magnified in the environment, resulting in dramatically enhanced skills. "The heritability studies weren't wrong," Flynn says. "We just misinterpreted them."

Dickens and Flynn showed that the environment could affect heritable traits like IQ, but one mystery remained: What part of our allegedly dumbed-down environment is making us smarter? It's not schools, since the tests that measure education-driven skills haven't shown the same steady gains. It's not nutrition—general improvement in diet leveled off in most industrialized countries shortly after World War II, just as the Flynn effect was accelerating.

Most cognitive scholars remain genuinely perplexed. "I find it a puzzle and don't have

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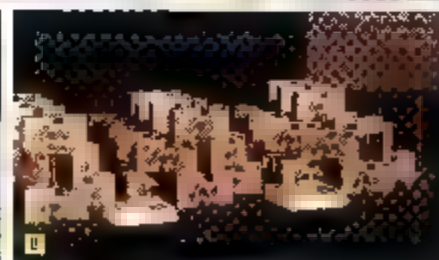
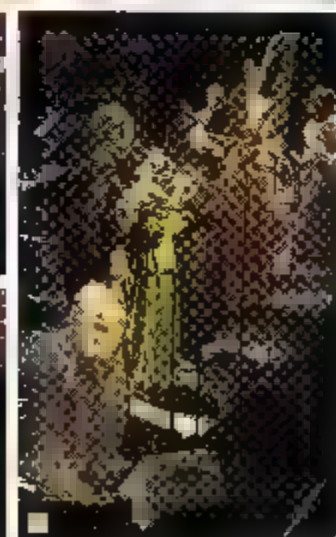
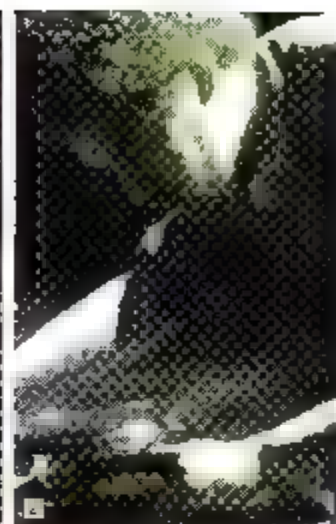
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On February 22nd, WIRED celebrated the 6th Annual WIRED Rave Awards at The Fillmore in San Francisco. The gala event honored the top mavericks, innovators, and leaders in 14 categories, including Film Director, Architect, Game Designer, Business Leader, and Scientist. Guests continued the celebration with a DJ set by this year's Rave Award winner for Music, Danger Mouse, followed by a special performance by The Polyphonic Spree.



1. Guests enjoy the awards celebration at The Fillmore 2. Danger Mouse 3. (left to right) Drew Fildes, vice President and Field Editor, WIRED; Ellen Almanzar, National Events Coordinator, Sony; and Courtney Rasmussen, District Manager Northern California & Hawaii, Sidney Frank Importing Co. 4. Chris Anderson, author of "The Long Tail" 5. 2007 WIRED Rave Award winners: David Rovers (stage right), author of "The Long Tail" 6. WIRED Rave Award winner: Brad Bird and his family 7. WIRED Rave Award winner: Rasmussen (left) and his wife with David Byrne 8. Adobe provided disposable cameras for guests to take snapshots throughout the evening 9. The Polyphonic Spree

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a compelling explanation," wrote Harvard's Steven Pinker in an email exchange. "I suspect that it's either practice at taking tests or perhaps a large number of disparate factors that add up to the linear trend."

Flynn has his theories, though they're still speculative. "For a long time it bothered me that *g* was going up without an across-the-board increase in other tests," he says. If *g* measured general intelligence, then a long-term increase should trickle over into other subtests. "And then I realized that society has priorities. Let's say we're too cheap to hire good high school math teachers. So while we may want to improve arithmetic, reasoning skills, we just don't. On the other hand, with smaller families, more leisure, and more energy to use leisure for cognitively demanding pursuits, we may improve without realizing it on the-spot problem-solving, like you see with Ravens."

When you take the Ravens test, you're confronted with a series of visual grids, each containing a mix of shapes that seem vaguely related to one another. Each grid contains a missing shape, to answer the implicit question posed by the test: you

need to pick the correct missing shape from a selection of eight possibilities. To "solve" these puzzles, in other words, you have to scrutinize a changing set of icons, looking for unusual patterns and correlations among them.

This is not the kind of thinking that happens when you read a book or have a conversation with someone or take a history exam. But it is precisely the kind of mental work you do when you, say, struggle to program a VCR or master the interface on your new cell phone.

Over the last 50 years, we've had to cope with an explosion of media, technologies, and interfaces, from the TV clicker to the World Wide Web. And every new form of visual media—interactive visual media in particular—poses an implicit challenge to our brains. We have to work through the logic of the new interface, follow clues, sense relationships. Perhaps unsurprisingly, these are the very skills that the Ravens tests measure: you survey a field of visual icons and look for unusual patterns.

The best example of brain-boosting media may be videogames. Mastering visual puzzles is the whole point of the exercise, whether

it's the spatial geometry of *Tetris*, the engineering oddies of *Myst*, or the urban mapping of *Grand Theft Auto*.

The ultimate test of the "cognitive, leisure" hypothesis may come in the next few years, as the generation raised on hypertext and massively complex game worlds starts taking adult IQ tests. This is a generation of kids who, in many cases, learned to puzzle through the visual patterns of graphic interfaces before they learned to read. Their fundamental intellectual powers weren't shaped only by coping with words on a page. They acquired an intuitive understanding of shapes and environments, all of them faced with patterns that can be detected if you think hard enough. Their parents may have enhanced their fluid intelligence by playing *Tetris* or learning the visual grammar of TV advertising. But that's child's play compared with *Pokemon*. ■ ■ ■

Contributing editor Steven Johnson
stevenbj@earthlink.net is the
author of *Everything Bad Is Good for You*,
*How Today's Popular Culture Is Actually
Making Us Smarter*.

BE SMARTER

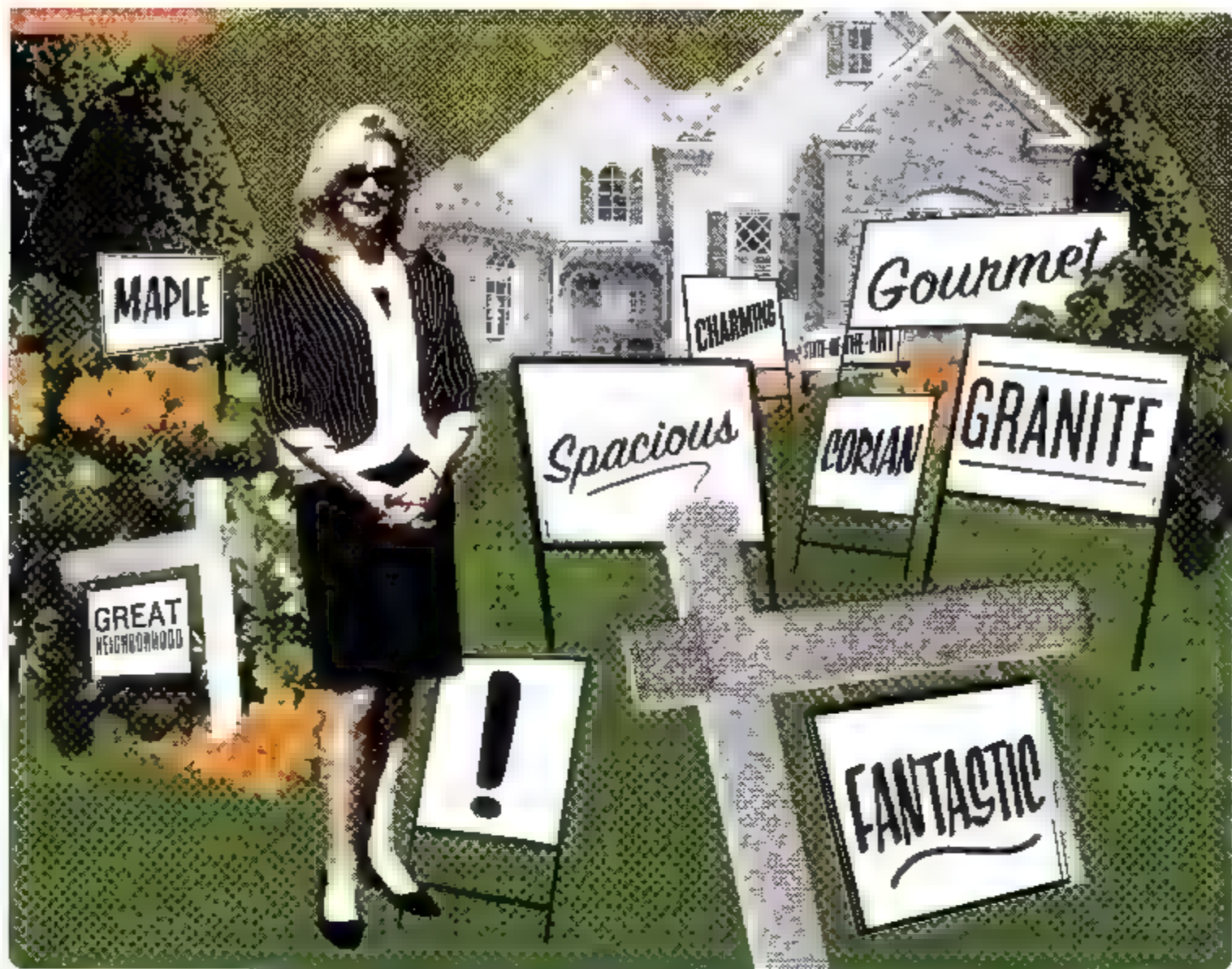
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Cracking the Real Estate Code

Is your agent really working for the enemy? A user's guide to home economics (and how to beat the expert industry). **by Mary Jo Lundy and Stephen J. Dunlop**

It's one of the biggest bets you can place on another person. You hire a real estate agent to sell your home.

She sizes up its charms, snaps some pictures, sets the price, writes a seductive ad, shows the house aggressively, negotiates the offers, and sees the deal through to the end. Sure, it's a lot of work, but she's getting a nice cut. On the sale of a \$300,000 house, you'll typically pay a 6 percent agent fee of \$18,000. That's a lot of money. But you tell yourself that you never could have sold the

house for \$300,000 on your own. The agent knew how to—what's that phrase she used?—maximize the house's value. She got you top dollar, right?

A real estate agent is every bit the expert. She is better informed than you about your home's worth, the state of the housing market, even the buyer's frame of mind. You depend on her for his information.

As the world has grown more specialized, countless such experts have made themselves similarly indispensable. Doctors,

lawyers, contractors, auto mechanics: They all enjoy informational advantage. And they use that advantage to help you. Right?

Information can be a beacon, or information can be a cudgel—it depends on who wields it, and how. In any transaction, it's common for one party to have better information than the other. In the parlance of economists, this is information asymmetry. There's value in asymmetry, it's the reason why someone,

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such as a consumer will pay someone else an expert, for his knowledge.

Of course, sometimes an expert might manipulate his advantage for his own benefit. If your doctor suggests that you have an angioplasty—even though current research suggests that angioplasty often does little to prevent heart attacks—your first thought won't likely be that the doctor is using his informational advantage to make a few thousand dollars for himself or his buddy. But as David Hillis, an interventional cardiologist at the University of Texas Southwestern Medical Center in Dallas explained to *The New York Times*, a doctor may have the same economic incentives as a car salesman or a funeral director or a mutual fund manager: "If you're an invasive cardiologist and Joe Smith, the local internist, is sending you patients, and if you tell them they don't need the procedure, pretty soon Joe Smith doesn't send patients anymore."

Or consider these findings of a 1996 medical study: Obstetricians in areas with declining birthrates are much more likely

incentive when selling your home after all, her commission is based on the sale price. And so your incentive and the agent's incentive would seem to be nicely aligned. But commissions aren't as simple as they seem. First of all, a 6 percent commission is typically split between the seller's agent and the buyer's. Each agent then kicks back half of her take to her agency. Which means that only 1.5 percent of the purchase price goes directly into your agent's pocket.

So on the sale of your \$300,000 house, her personal take of the \$18,000 commission is \$4,500. Still not bad, you say. But what if the house was worth more than \$300,000? What if, with a little more effort and patience, she could have sold it for \$310,000? After the commission—that puts an additional \$9,400 in your pocket. Yet the agent's additional share—her personal 1.5 percent—is a mere \$190. So maybe your incentives aren't aligned after all. Is the agent willing to put out all that extra time and energy for just \$190?

There's one way to find out: measure the difference between the sales data for houses

Can You Crack the Code?

Listed below are 10 terms commonly used in real estate ads. Five have a strong positive correlation to the ultimate sales price and five have a strong negative correlation. Which are which? See Answers on the following page.

- fantastic
- granite
- spacious
- state-of-the-art
- 1
- Corian
- charming
- maple
- great neighborhood
- gourmet

This is the agent's main weapon, the conversion of information into fear. Consider this true story, related by John Donohue, a law professor who in 2001 was teaching at Stanford University: "I was just about to buy a house on the Stanford campus and the seller's agent kept telling me what a good deal. I was getting because the market was

THE EXPERT'S MAIN WEAPON: THE CONVERSION OF INFORMATION INTO FEAR.

to perform cesarean section deliveries than obstetricians in growing areas—suggesting that when business is tough, doctors may try to ring up more expensive procedures.

The Internet, of course, is all about smoothing over these asymmetries in one industry after another. From life insurance to used cars, the Web has eliminated the expert's upper hand by giving once-exclusive information to the online masses. But some industries have been slow to change—real estate among them.

The best way to observe information asymmetry at work is to measure how an expert treats you versus how he performs the same service for himself. Real estate provides the perfect opportunity, since housing sales are a matter of public record, and real estate agents often do sell their own homes. Recent data covering the sale of nearly 100,000 houses in suburban Chicago show that more than 3,000 of those houses were owned by agents.

Before plunging into the data, a question: What is the agent's incentive when selling her own home? Simple: to make the best deal possible. Presumably this is also her

that belong to real estate agents themselves and the houses they sold on behalf of clients. Using the information from those 100,000 Chicago homes—and controlling for any number of variables—location, age and quality of the house, aesthetics and so on—

it turns out an agent keeps her own home on the market an average of 10 days longer and sells it for an extra 3-plus percent, or \$10,000 on a \$300,000 house. When she sells her own house, an agent holds out for the best offer when she sells yours she pushes you to take the first decent offer that comes along. Like a stockbroker churning commissions, she wants to make deals and make them fast. Why not? Her share of a better offer—\$150—is too puny an incentive to encourage her to do otherwise. So her job is to convince you that a \$300,000 offer is in fact very good, even generous, and one that only a fool would refuse.

This can be tricky. The agent doesn't want to come right out and call you a fool. So she merely implies it—perhaps by telling you about the bigger, nicer, newer house down the block that has sat unsold for six months

about to zoom. As soon as I signed the purchase contract, he asked me if I would need an agent to sell my previous Stanford house. I told him that I would probably try to sell without an agent, and he replied, "John, that might work under normal conditions, but with the market tanking now, you really need the help of a broker."

In five minutes, a zooming market tanked. Such are the marvels that can be conjured by an agent in search of the next deal.

So a big part of a real estate agent's job is to persuade the homeowner to sell for less than he would like while at the same time letting potential buyers know that a house can be bought for less than its listing price. To be sure, there are more subtle means of conveying this information than blatant lying: telling the buyer to bid low. The Chicago study also reveals how agents exert influence through the listings they write. A phrase like "well maintained," for instance, is full of meaning to an agent: the house is old but not quite falling down. A savvy buyer will know this (or find out once he sees

the place, but to the retiree who is selling the house, "well maintained" might sound like a compliment, which is just what the agent intends.

An analysis of the language used in real estate ads shows that certain words are powerfully correlated with the final sale price of a house. This doesn't necessarily mean that labeling a house "well maintained" causes it to sell for less than an equivalent house. It does, however, indicate that when an agent labels a house "well maintained," she is subtly encouraging a buyer to bid low.

So consider the terms in the box on the previous page. A "fantastic" house is surely fantastic enough to warrant a high price, right? What about a "charming" and "spacious" home in a "great neighborhood"? No, no, no, no, and no.

In fact, the terms that correlate with a higher sales price are physical descriptions of the home itself: granite, Corian, and maple. As information goes, such terms are specific and straightforward – and therefore pretty useful. If you like granite, you might like the house, but even if you don't, "granite" certainly doesn't connote a fixer-upper. Nor does "gourmet" or "state-of-the-art," both of which

seem to tell a buyer that a house is, on some level, fantastic.

"Fantastic" meanwhile, is a dangerously ambiguous adjective, as is "charming." These words, it turns out, are real estate agent code for a house that doesn't have many specific attributes worth describing. "Spacious" homes, meanwhile, are often decrepit or impractical. "Great neighborhood" signals to a buyer that, well, *this* house isn't very nice, but others nearby may be. And an exclamation point in a real estate ad is bad news for sure: a bid to paper over real shortcomings with false enthusiasm.

If you study an ad for a real estate agent's own home, meanwhile, you see that she emphasizes descriptive terms – especially "new," "granite," "maple," and "move-in condition" – and avoids empty adjectives (including "wonderful," "immaculate," and the telltale "I"). She patiently waits for the best buyer to come along. She might tell this buyer about a house nearby that just sold for \$25,000 above the asking price, or another house that is the subject of a bidding war. She is careful to exorcise every advantage of the information asymmetry she enjoys.

But even the agent's advantage has been

Answers

Positive correlation

• granite • state-of-the-art • Corian
• maple • gourmet

Negative correlation

• fantastic • spacious • !
• charming • great neighborhood

eroded by the Internet. After all, anyone can now get online and gather information about sales trends and housing inventory and mortgage-rate tremors. And recent sales data is starting to show the results: Agents still get a higher price for their own homes than for comparable homes owned by their clients – but since the proliferation of real estate Web sites, the gap between the two prices has shrunk by a third. The information has been set loose. ■ ■ ■

Adapted from Freakonomics: A Rogue Economist Explores the Hidden Side of Everything, copyright © Steven D. Levitt and Stephen J. Dubner, published by William Morrow. Levitt is an economist at the University of Chicago. Dubner is an author and journalist.

EVENTS AND PROMOTIONS

WIRE

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THE WIRED SPEAKER SERIES

11 PART 1: 10:00 AM - 11:00 AM 92ND STREET Y THE MUSEUM OF SCIENCE AND INDUSTRY

NEW YORK CITY:

CHICAGO:

Craig Venter Ph.D. is the founder and president of the J. Craig Venter Institute, a leading research foundation, as well as founder and chairman of the Institute for Genomic Research. He was also director and president of Celera Genomics, where he and his team are credited with sequencing the human genetic code.

92ND STREET Y

10:00 AM - 11:00 AM
10:00 AM - 11:00 AM
10:00 AM - 11:00 AM
10:00 AM - 11:00 AM

Venter will discuss his ongoing quest for the world's most diverse life forms, inspired in part by the great scientific voyages of the 18th and 19th centuries. He has also led the way in sequencing and sequencing in the genome, and has already discovered 10 new species of more than 12 million genes.

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THE 2005 WIRED



BY DUFF McDONALD



01 APPLE COMPUTER

(Powerhouse)

As the world moves toward open standards, the last true believer in closed systems refuses to capitulate. Funny thing: No one is asking Apple to change. That's because the computermaker-turned-consumer-electronics-powerhouse has made a virtue of proprietary control, consistently delivering quality and flair. The company sold 8.2 million iPods in 2004, and iTunes accounted for 70 percent of legal music downloads, leading to exceptional revenue and profit in Q4. With such a foothold in music, can an assault on TV be in the air?

CHALLENGE Woo all surprise users who still dismiss the variety offering. As a Dell spokesperson scoffs: "Is it innovation if no one buys it?"

OPPORTUNITY Build on the iPod/iTunes strategy. How about an Apple video camera that adds value to Final Cut Pro?

02 GOOGLE

The Answer

The Internet's librarian turns out to be its biggest power broker. Fueled by \$3.2 billion in 2004 revenue, Google fulfills 200 million searches of 8 billion Web pages a day, determines

ranking which sites are seen and which remain buried. And new initiatives keep turning local search maps, movie showtimes, searchable television content. A recent post on Slashdot.org puts it neatly: "In a few years, you'll be driving your Google to the Google to buy some Google for your Google."

CHALLENGE Retain valuable employees. Now that the fortunes have been made, workers may have little incentive to stay.

OPPORTUNITY Wrest screen real estate from Microsoft. Desktop search is just the thing to capture the first parcel.

03 SAMSUNG ELECTRONICS

Gadget Master

It China is the number one Asian threat to the U.S. consumer electronics industry—number two is the republic of Samsung. The South Korean company racked up profits of \$10.8 billion in 2004, more than Sony, Matsushita, Motorola, and Nokia combined. It leads in flash memory and computer displays and ranks third in cell phones. With 15 R&D centers around the globe and the perfect test market in its backyard, Samsung gives even the cut-rate Chinese reason to tremble.

CHALLENGE Currency exchange rates. The falling dollar is bound to crimp the company's earnings.

OPPORTUNITY See the new Sony. The tech and trendies are here; the image-sill needs work. Time for an all-out branding offensive. For more on Samsung, see page 126.

04 AMAZON.COM

Mail World

Jeff Bezos is finding that it pays to gamble. Not long ago he bet that customers would come to Amazon for more than books. Last Thanksgiving weekend, his company sold more electronics items than books for the first time. Now Amazon's CEO is wagering beyond e-commerce. In September, Bezos rolled out a search engine, AG.com, that offers recommendations: "If you liked that site, you'll love this one." That's more than a shopping service. It's an assault on Google and Microsoft.

CHALLENGE Show us the money. Bezos has proven his bookshop can grow, but profits have been paltry.

OPPORTUNITY Partner with Netflix or crush it. Amazon could very well do either. It owns the Internet Movie Database, and it's prototyping DVD rentals in the U.K.

05 YAHOO!

Next Stop: Hollywood

Ten years after winning Stanford engineering students undertook a quixotic effort to categorize every page on the Web, Yahoo! is set to storm Hollywood. It has revenue, \$3.6 billion in 2004; it has eyeballs, 345 million pairs every month. It has broadband partnerships with reality TV kingpin Mark Burnett and *Entertainment Tonight*. CEO Terry Semel has hired ABC executive David Breiher, the guy who green-lit *Desperate Housewives*, to cook up compelling shows. Can he direct Yahoo! to



Wisteria Lane?

CHALLENGE: Keep at least one eyeball on Google. Yahoo! is still an ad-driven Web portal at heart.

OPPORTUNITY: Create content. Yahoo!'s numbers make TV's sweeps-week audience look tiny.

06

ELECTRONIC ARTS

08 Game MVP

The videogame industry has grown up. The first generation of gamers is over 30 and can afford every new release. At the same time, developers wield the upper hand in negotiations with movie studios, record companies, and sports leagues. The uppermost hand of all: Electronic Arts, with 27 platinum titles in 2004. Despite *Harry Potter* and *The Lord of the Rings*, sports are still EA's strength. In December the company announced an exclusive five-year deal with the NFL, sending competitors to ride the pine.

CHALLENGE: Show Hollywood who's boss. EA makes great games out of movies. When do we get a great movie made out of a game?

OPPORTUNITY: Steal *Grand Theft Auto's* thunder. The deal to turn *The Godfather* into a game gives EA entrée into the "mature" genre.

07

GENENTECH

04 Forever Young

It's as if the Knack were still on the charts. Genentech, founded in 1976, has dodged biotech's one-hit wonder syndrome. It now has 13 discoveries on the market, thanks to the FDA's November approval of the lung cancer treatment Tarceva. Avastin for colon cancer notched \$555 million in sales last year, but could reach several billion annually if it's approved for ovarian and lung cancers as well.

CHALLENGE: Intellectual property loopholes. And as Zenotech Labs has announced a knockoff of Genentech's lymphoma-fighting Rituxan for one-third the price.

OPPORTUNITY: Make traditional chemo obsolete. Avastin is a start.

08

TOYOTA

18 Hot Wheels

What car won *Consumer Reports'* most recent customer satisfaction survey? The Prius. Toyota's hybrid model is taking over the road, boosting fuel efficiency to 60 mpg and taunting JS automakers to catch up. The only roadblock is cost, but there's good reason to believe Toyota can get past it. Anticipating sales of 100,000 hybrid vehicles in 2005, the company is doubling production, and third parties like Toshiba and Panasonic are ramping up assembly lines to supply parts. Economies of scale are dead ahead.

CHALLENGE: Style. Nobody buys a Prius because they love the design.

OPPORTUNITY: Sell to companies with huge, gas-guzzling fleets. FedEx and UPS could save a bundle by going hybrid.



09

INFOSYS TECHNOLOGIES

11 Outsourcerer

The caricature of the Indian outsourcing industry as a voracious monster bent on devouring U.S. jobs isn't just oversimplified; it's

obsolete. Case in point: Infosys. The Indian outsourcing shop, which garnered \$1.1 billion in sales last year, is hiring 500 employees for Infosys Consulting, a \$20 million foray into high-end IT advice based in guesswork. Fremont, California. Dirt-cheap outsourcing plus strategic guidance makes for a powerful combination, and one that moves jobs back to the US.

CHALLENGE: Beware the rest of Asia in the low-cost sweepstakes. China is no India, as India is no Western economies.

OPPORTUNITY: Do a little U.S. consultancy what Dell did to the PC industry.

10

eBAY

05 The Buyer's Seller's Market

Once the world's biggest yard sale, eBay has become the epitome of e-commerce: a global marketplace responsible last year for \$34.2 billion worth of auctions and fixed-price sales. With no inventory costs, eBay generates net margins of 24 percent. Meanwhile, the company's PayPal division is becoming the standard for online payments. With 56 million active users, eBay has a big say in what gets sold online and how we pay for it.

CHALLENGE: Stop taking sellers for granted. After recent fee increases, 7,000 eBay stores closed.

OPPORTUNITY: China. eBay must do better there than it did in Japan, where it got spanked by Yahoo! in 2001 and beat a retreat.

11

SAP

14 Owns the Enterprise Zone

Larry Ellison so fears SAP that he bought PeopleSoft. Bill Gates once nearly bought SAP itself. What are they afraid of? The German soft-

Duff McDonald: duffmcd@mac.com wrote about theoretical physics in issue 13.01

by EA to endow the first university chair for the study of electronic gaming. — If B: Wholesale cost of a 30-day supply of Genentech's lung cancer drug Tarceva.



Waikiki, Kansas.

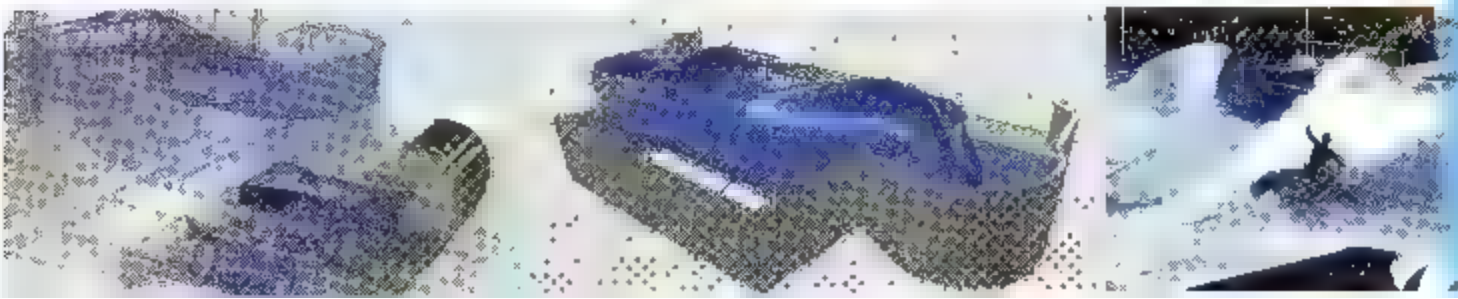
Idea

Design and create the perfect artificial wave for landlocked surfers.

Realized

Wave Loch™ Tom Lochtefeld designed a pump system that moves 100,000 gallons of aging water into the perfect mold. It is designed to be used every day. The world's #1 selling 3D design software. Waves don't come in 2D. Surfing is a sport that's been around for months. Autodesk® manufacturing solutions can help you realize your ideas to produce a product. To find out more, visit autodesk.com/manufacturing

Autodesk



were house-giving a 25,000-plus corporate customers a way to aggregate the various apps that run large-scale enterprises, from inventory to payroll to shipping. And unlike Oracle and Microsoft, SAP's sales pitch doesn't push customers to buy a particular OS or database.

CHALLENGE Market saturation: Large companies already have enterprise software, forcing SAP to set its sights on smaller operations.

OPPORTUNITY Steal away regions of PeopleSoft customers: dissatisfied with the way Oracle has managed the product.

12

09

PIXAR

Simply Incredible

Why didn't anyone tell Hollywood it was so easy? Release a great movie in a decade and your studio will be worth more than \$5 billion. OK, it's not as easy as Pixar makes it look. The digital animation trade CG de rigueur in feature-length cartoons, forcing Disney to shelve its traditional stick-figure Pixar's latest opus, *The Incredibles*, grossed \$260 million at the box office, and hopes are high for next summer's *Cars*. You can't find a more perfect marriage of art, tech, and commerce.

CHALLENGE Keep it up. Even superheroes stumble once in a while.

OPPORTUNITY Redefine the relationship between creatives and suits. When Pixar's coproduction deal with Disney expires in 2006, the artists will be calling the shots.



14

13

IBM

Ware in the World

IBM has proven surprising dexterity not only in entering markets but in exiting them as well. CEO Sam Palmisano's decision to sell the PC division to discount computer merchant Lenovo is the latest example of IBM's ability to move on after a product has played out, and done the same with disk drives and memory chips. Meanwhile, the company's early embrace of RFID shows it's not afraid to place bold new bets.

CHALLENGE Salvage the

CEO John Chambers insists double-digit growth can continue even as the company's core markets mature. He's using his \$16.5 billion war chest to fund both internal R&D and shrewd acquisitions like wireless LAN specialist Arista. The goal: an adaptive, self-defending network.

CHALLENGE Convince corporate customers their phones are safe with Cisco. The company clawed back a portion of Merriam's phone business it had lost to Avaya, but its grid as a voice-over-IP provider remains weak.

OPPORTUNITY Thaw the chill on Wall Street. Stop one. Expense reports and cash dividends are proving that Cisco is finally past bubble-era thinking.

company's \$10 billion utility processing footprint by persuading customers to rely on processing power on the server than buying it outright.

OPPORTUNITY Reinvent the PC. The 256-bit gap on Celeron that BM is leveraging with Toshiba and Sony promises to turn the next-gen PlayStation into a \$200 media center. Look out, Lenovo.

15

16

NETFLIX

Blockbuster Buster

Is there a happy ending in 1999 upstart Netflix's plan to revolutionize the movie-rental industry by sending DVDs by mail for a flat monthly fee. Now it's a serious beach-head candidate, thanks to competition from Blockbuster and Wal-Mart. CEO Reed Hastings has responded by dropping the monthly price, and it seems to be working. Netflix had 2.8 million subscribers as of year-end 2004 and in the fourth quarter enjoyed its lowest churn ever. But watch out for Amazon.com.

CHALLENGE Pricing. Netflix is trying to hold the line at \$17.99 a month while Blockbuster charges \$14.99. Now that's a test of customer loyalty.

OPPORTUNITY Video-on-demand. Netflix and TiVo don't have dig-to-delivery wrapped up, but if they lose first-mover advantage, they're toast.

13

10

CISCO

The Network Connection

Tech companies rarely age gracefully, but Cisco, embracing middle age more like George Clooney than Mickey Rourke, increasingly the network finally is the computer making the hub-and-router manufacturer more relevant than ever.



2 Consecutive years in which IBM has been awarded more patents than any other US company | 3,000,000 DVDs shipped weekly by Netflix | 350,000 Patients who

To you it's a hotel lobby.
To us it's the entrance to your comfort zone.

AMENITY
27

Hand and foot
massage
service

AMENITY
48

24-hr. Oak
Pet. & everything
you need

AMENITY
59

24-hr. Express
check-in
check-out

AMENITY
64

24-hr. Express
check-in
check-out

AMENITY
55

Room to relax not
just in your room

AMENITY
39

24-hr. Express
check-in
check-out

AMENITY
34

24-hr. Express
check-in
check-out

AMENITY
53

Over 220 convenient
locations that are
easy to find

AMENITY
36

24-hr. Express
check-in
check-out



**Hilton
Garden Inn**

Everything. Right where you need it.

16

DELL

12

Cost Cutter

The real reason Carly Fiorina was ousted from Hewlett-Packard: She couldn't compete with Dell's low-cost direct-sales model. Now the Texas discounter has its sights set on consumer electronics. But unlike PC shoppers, TV buyers like to see screens before they order one, so Dell is installing kiosks in shopping malls. Cheapskates need not worry that they'll end up paying the extra marketing expense. Dell's 42-inch plasma sells for \$3,500—half the price of a comparable Sony.

CHALLENGE: Focus on first. Lenovo chased Dell out of China's market for stripped-down, dirt-cheap PCs. How will Dell fare when it's not the cheapest option?

OPPORTUNITY: Marry low cost and high style. Dell's pricing prowess makes it a perfect match with Apple's \$100 iPod photo, anyone?

17

GENERAL ELECTRIC

Vast is Beautiful

GE isn't one company, it's many: a global megaconglomerate whose 11 divisions span finance, health care, energy, nanotech, and entertainment. When CEO Jeffrey Immelt took over in 2001, the company faced a future of slowing growth and narrowing



18

MEDTRONIC

NEW

Bionic Business

The Six Million Dollar Man was overpriced. So is a Medtronic implantable heart monitor. Parkinson's busting neurostimulator. Spinal fixator and blood-sugar sensor. And you're probably under a million. All-in. Headquartered in Switzerland and Japan, Medtronic is at the forefront of extending human physiology through technology with sedes in image-guided surgery systems, defibrillators and the like. A heady 18 percent growth rate led to 2004 sales approaching \$10 billion, of which nearly 22 percent was profit.

The posthuman gold rush is on.

CHALLENGE: Get back to being the first responder. Medtronic ceded that position behind competitors Boston Scientific and Johnson & Johnson in developing drug-coated stents used to prop open arteries.

OPPORTUNITY: Get people hooked up to the Internet. Literally. A national health information network that gathers real-time data from devices in patients' bodies could change medicine forever.

19

INTEL

24

Processor Central

Overwhelming market share (82 percent) in desktop microprocessors won't be enough to keep Intel on top. As the PC era gives way to a proliferation of portable devices, the company is scrambling to reinvent itself. In January, president and soon-to-be CEO Paul Otellini declared a new focus: the mobile marketplace. He reorganized the company and diverted a portion of the company's \$4.8-billion R&D budget into chips for cell phones, MP3 players, and PDAs. Look for Intel inside your palmtop.

CHALLENGE: Take on Samsung, which not only excels in cell phone chips but maintains a firm grip on Asian suppliers.

OPPORTUNITY: Extend the product line. Otellini, who will be Intel's first nonengineer head honcho, plans to move into chipsets, software, and development tools.

20

SALESFORCE.COM

NEW

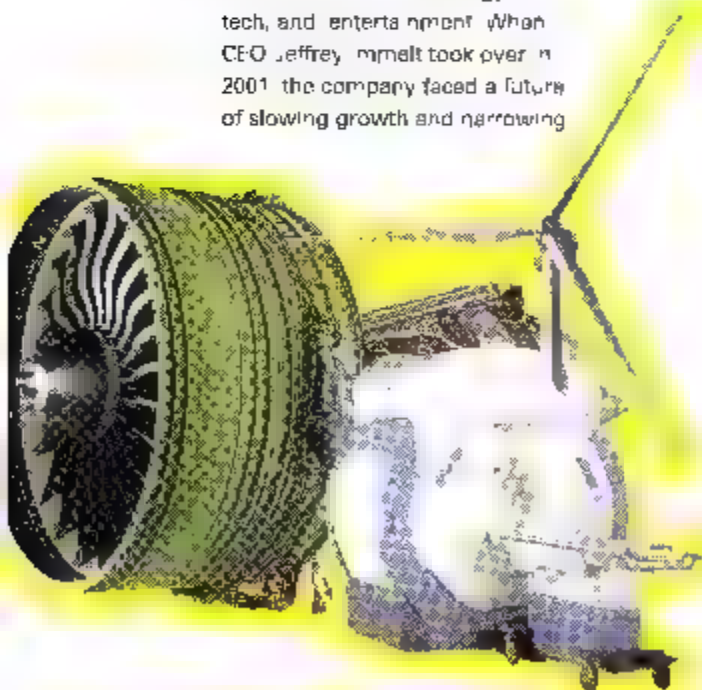
Software as Service

There was a moment, circa 1999, when everyone loved the idea of delivering productivity software as a Web-based service. Then they moved on. In the next fall, B + B Salesforce.com CEO Marc Benioff stuck to his guns, and today his company helps 13,900 corporate clients manage their customer relations. Last year it brought in \$176 million. By eliminating the time and expense of installation,

Salesforce.com gains a huge advantage. The company released 17 revisions of its software in the same time Microsoft turned around only two versions of its SQL server.

CHALLENGE: Find a. If Salesforce.com slows down, it could be steam-rolled by an outsourcer.

OPPORTUNITY: OK, Benioff, you were right. Now sell the company to IBM.



transmit heart data to doctors via the phone system by holding an antenna over a Medtronic implantable defibrillator | 30 Days Salesforce.com's 2004 IPO was

MORE THAN JUST A PRETTY INTERFACE.



usps.com

21 VODAFONE

19 ▼ Global Mobile

It's showtime. After a decade of billions to infrastructure investments, customer acquisition, and price wars, Vodafone rolled out 3G services in 13 countries late last year. Now the European carrier, which ranks second globally in subscribers to China Mobile, will find out whether its 152 million customers really want to play music, videos, and games on their handsets. With 500,000 songs and premium partners such as Warner Music, Sony BMG, Electronic Arts, and Fox, Vodafone is ready for the download deluge.

CHALLENGE Capture Asia. Reports from Japan—one of the most advanced 3G markets—have Vodafone performing so badly that it might unload its Tokyo division. **OPPORTUNITY** Sell business users on 3G. They could attend video conferences while riding the bullet train, or saving the Caribbean.

22 FLEXTRONICS

20 ▼ Building Your Brand

Among equipment makers, Flextronics has hit the market as a top-tier customer, low-cost operations, and a foothold in a variety of industries. The company manufactures electronics for brand names like Cisco, Dell, Motorola, Nokia, and Sony-Ericsson out of six industrial parks in the developing world. Last year, Flextronics bought the Agilent division that makes cell-phone camera modules, and in January struck a deal to build Nortel's phones. With \$15 billion in annual sales, who needs a brand?

CHALLENGE Gauge demand accurately. In 2001, Flextronics got caught with excess capacity and had to ax 27,000 employees.

OPPORTUNITY Push the higher-margin design business. Clients are biting. Handsets codeveloped with Microsoft are on the way.

23 EMC

26 ▲ Bit-Deposit Box

Data storage leader EMC revitalized its flagging business by shifting focus from big-ticket hard disk arrays to hardware-agnostic software. Competitors have followed suit, so now the company is focusing on a concept called information life-cycle management. The gist: The value of data changes over time. A cost-effective storage strategy is to channel less-on-critical data to the fastest, most secure hardware, then retire it to a lower-cost system as its value falls. Meanwhile, a string of acquisitions is keeping EMC's own value high.

CHALLENGE Fight an over-intensifying war on two fronts: software, against the veritable Symantec alliance, and hardware, with IBM and Hitachi.

OPPORTUNITY Distributed enterprise. EMC cracked small and medium-size businesses by partnering with Dell. Now it hopes an alliance with Cisco will repeat the trick with far-flung businesses looking to consolidate their data.

24 NVIDIA

22 ▼ The Third Dimension

Nvidia's crappy 2003 would have killed a lesser company. The graphics specialist's new chip fell behind schedule and ultimately turned in

a sluggish performance. Then Microsoft gave Nvidia's covered Xbox slot to rival ATI. Stunned, CEO Jen-Hsun Huang retooled Nvidia's design and manufacturing pipeline. The results were on display in 2004: the popular NV40 chip, a high-performance graphics monster and a place in Sony's PlayStation 3.

CHALLENGE Gain market share.

Nvidia forecasts a 15-point share increase in notebooks in 2005.

OPPORTUNITY Replicate the "into inside" effect, so consumers demand Nvidia chips in their devices. Savvy marketing could do the trick.

25 JETBLUE

New

Sky's the limit

Five years ago, JetBlue started with one flight a day between New York City and Fort Lauderdale, Florida. Now it makes 280 jumps to 30 cities daily. The key to success? A focus on efficiency and service. Sure, rival Southwest is more profitable, but JetBlue slashes fares without sacrificing luxuries: leather passenger assign seating, 36 channels of seat-back television, and live customer-service agents who work at home to keep costs down. And it's entirely paperless, from reservation desk to cockpit.

CHALLENGE A growing list of hungry discounters. Delta modeled its recent reorg on Southwest, and



delayed after the CEO granted an interview to *The New York Times* during the company's quiet period. ■ 0.7 Customer complaints per 100,000 JetBlue passengers.

the new black

powered by cisco.

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...powered by cisco...
...the new black...
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...powered by cisco...
...the new black...
...powered by cisco...



CISCO SYSTEMS

powered by

others will surely follow.

OPPORTUNITY: Transatlantic business. Time to take off for Europe.

26

FEDEX

20

Anywheres, Overnigh

The global economy couldn't function without rapid transport of everything from foodstuffs to first-run film reels. FedEx delivers the goods, moving 6 million packages daily. Last year's acquisition of Kinko's and rebranding of its stores as FedEx Kinko's mean customers make copies and ship them at the same location. Now CEO Frederic Smith is eyeing Europe's high-speed train system to strengthen his grip on the euro zone.

CHALLENGE: Stay on top of electronic document delivery. Competitors like Pitney Bowes are eyeing the same business.

OPPORTUNITY: Deliver services as well as packages. By persuading customers to turn their supply chains over to FedEx, the logistics king could advance beyond the mail room.

27

MONSANTO

17

Sowing Controversy

Monsanto has bowed to protest postponing plans to sell genetically modified wheat, potatoes, and "pharmaceuticals." These retreats suggest the company will forgo engineered crops, canola, corn, cotton, and soybeans. Sales hit \$5.5 billion in its latest fiscal year, but CEO Hugh Grant is hedging. In May, he's due to acquire non-GM seed leader Seminis, tightening his grip on the global market for seeds lab-made or not.

CHALLENGE: Win over European farmers. If soybeans didn't do it, maybe the perfect grape will.

OPPORTUNITY: Drop the protective stance toward intellectual property and do something truly monumental: feed the hungry.

28

MICROSOFT

22

Central Nervous System

The networked home is nearly wired, but the battle over which device will sit at its center—PC, set-top box, or game console—rages. Holding \$34.5 billion in cash, Gates & Co. has spread its bets. The Media Center version of Windows is a hit; the Xbox is holding its own against Sony's PlayStation, and the giant's set-top software is touted by phone and cable companies. Ring-side seats are as close as your living room.

CHALLENGE: Where to beg? Finish the Longhorn OS, stop the migration of customers to Linux.

OPPORTUNITY: Lock up the desktop even more tightly. Dominating PCs wasn't a bad move. Now monopolize the living room.

29

NOKIA

16

Cell Survivor

If Nokia had a ring tone, it would sound like a sigh of relief. The king of the handset clawed its way back to 33 percent of global market share in Q4, after dropping below 29 percent. The company had missed two crucial trends: clamshells and phonecams, and competitors pounced. Nokia responded by slashing prices. Having sold 208 million phones last year, double the number of second-place Motorola.

The Flying Finn is still on top. It plans to introduce 40 models this year, including its first 3G units.

CHALLENGE: Regain the reputation of hippest cell phone maker around. Judging by Motorola's hotter-than-hot RAZR phones, there's work to be done.

OPPORTUNITY: The mobile workforce. Nokia's control of the Symbian alliance, whose software is in 80 percent of smartphones, positions the company to benefit whenever workers connect to HQ.



30

COSTCO

25

Upscale Wholesale

Costco, the blue-state answer to red-state megastore Wal-Mart, has found that even affluent urbanites will shop in a warehouse if you give them quality and variety at the right price. How about those authentic Picasso drawings and 100 percent merino wool sweaters from Ralph Lauren? Costco marks up most items a mere 15 percent, as opposed to the retail standard 30 percent plus. Employees also get exceptional value: Costco's average hourly salary of \$16 trounces Wal-Mart's \$9.99, and its workers enjoy better health coverage, too.

CHALLENGE: Outmaneuver Sam's Club, which aims for small business owners, and BJ's Wholesale Club, which targets consumers.

OPPORTUNITY: Cut promo deals with businesses that want to get in front of Costco's 27 million members. The take would be pure profit.

31

COMCAST

30

Broadbandit

Comcast backed out of a grab at Disney last April, yet emerged with its reputation intact. How? First by having 21.5 million subscribers, the most in the U.S. cable industry.

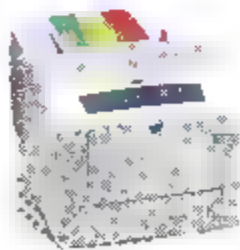
... Dollars Microsoft is reportedly paying Alex Garland, author of *The Beach*, to adapt *Halo* for the screen.

... Rottisserie chickens Costco sold in 2004.

BRAVO

With lightning speed and brilliant color, no wonder the Xerox Phaser® 8400 printer is getting rave reviews. And starting at just \$999, it's cause for celebration. **Xerox Color. It makes business sense.**

What does \$999 buy you? Quite a bit, when you're talking about the Phaser 8400. It prints vivid color plus black and white at the same incredible speed—24 pages per minute. So it's no surprise that it's winning all kinds of industry recognition. Like PC World's Best Buy Award for Color Laser Printers, as



well as Bayer's Laboratory's Pick of the Year for Outstanding Critical Color Printer. Not to mention Better Buys for Business's 2004 Hot Pick Award. To learn more about our full line of Xerox network printers, digital copiers and multi-function systems, call or visit our website today. Champagne, anyone?



xerox.com/office/winning8400
1-877-262-6567 ext. 1977

Technology | Document Management | Consulting Services

And by succeeding at the dream of every cable provider, up-selling Comcast has signed up 40 percent of its customers for digital cable and almost a third for high-speed Net access. The copper is voice over IP. Comcast expects 8 million VoIP customers in five years.

CHALLENGE: Position the company to be a leader of video-on-demand. The first step was buying a piece of Motro-Guidwyn-Mayer last year.

OPPORTUNITY: Keep expanding into telecom. Comcast offers the most complete bundle in the cable industry. Why not add a cellular plan?

32

28

Pfizer

Industrial Pharmar

Big pharma requires big money and Pfizer's got it. The company brings in more sales (\$52.5 billion in 2004) and spends more on R&D (\$7.7 billion) than any of its peers. And it's hugely productive, with 145 new compounds in the pipeline and 2,000 research partners searching for the next Lipitor or Viagra. Sure, the industry suffers from outrageous development costs and an uncertain market, but Pfizer's prescription is powerful stuff.

CHALLENGE: Dodge fallout from the banning of Merck's Vioxx. Pfizer

manages to keep its similar formulae, Celebrex and Bextra, on the market. It could face a backlash in courts and on store shelves.

OPPORTUNITY: Embrace open systems. Pfizer hopes to corner the market for cholesterol drugs by bundling a promising newcomer with blockbuster Lipitor. Separating them would address a broader market and better serve patients.

33

NEW

LI & FUNG

High Textile

With 65 offices in 38 countries, this Hong Kong company is the ultimate middleman. It custom-tailors supply chains, acting as connective tissue between global brands (like The Limited) and their far-flung manufacturers. In the process, Li & Fung has become one of the largest suppliers of Chinese-made clothing. The company handles everything from product development to finding the right factories to filling out custom forms. Yet it doesn't have production facilities of its own—it's the outsourcer that outsources.

CHALLENGE: Play politics as effectively as production. China's bureaucracy is a tough customer.

OPPORTUNITY: Launch a Li & Fung label. The company would need to avoid competing with its own customers, but why should established brands get all the glory?

34

NEW

TAIWAN SEMICONDUCTOR

Blue-Chip Maker

With the cost of building a cutting-edge silicon foundry approaching \$4 billion, electronics companies have a compelling reason to outsource chip fabrication. Giving the job to Taiwan Semiconductor, as hardware makers like Broadcom, Sony, and Texas Instruments focus on design while dodging serious capital investment like Taiwan Semi's planned \$2.6 billion for 2005. And the company has a ne-

on the world's most dynamic market. It's one of the few Taiwanese tech outfits approved to build plants in mainland China.

CHALLENGE: IBM, Big Blue is moving aggressively into the foundry business.

OPPORTUNITY: Poach customers from struggling rivals as the chip industry enters another of its cyclical downturns.

35

32

GEN-PROBE

A Germ's Worst Nightmare

Someday doctors will use genomic data to prevent infectious diseases. Jnt. then, there's Gen-Probe, whose nuclear acid tests detect scourges like hepatitis, HIV, pneumonia, and tuberculosis. Forty Gen-Probe products have gained FDA approval; its Proclix assay now screens more than 80 percent of the U.S. blood supply. The result is fewer blood-borne infections, not to mention 2004 sales of \$270 million and gross margins of 78 percent. That's one healthy business.

CHALLENGE: Keep its big partners happy. Gen-Probe has been embroiled in contractual disputes with two, Chiron and Bayer.

OPPORTUNITY: Developing nations, where 43 percent of blood donations aren't tested for disease.

36

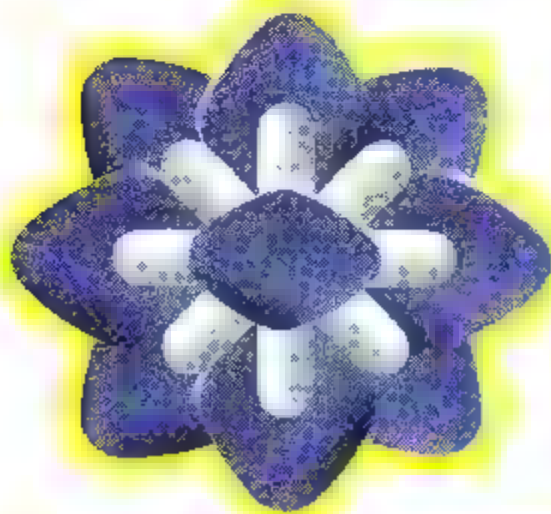
36

CITIGROUP

World Banker

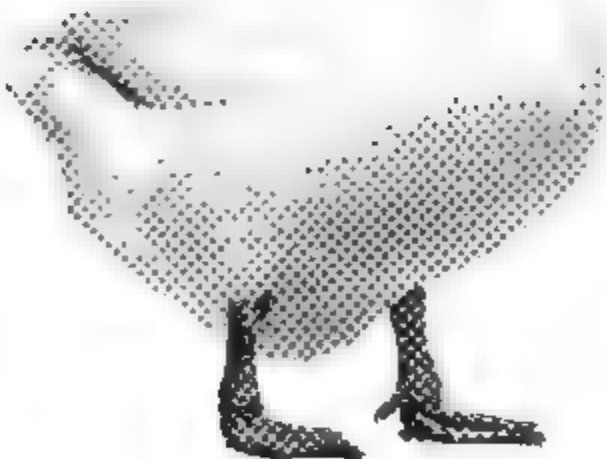
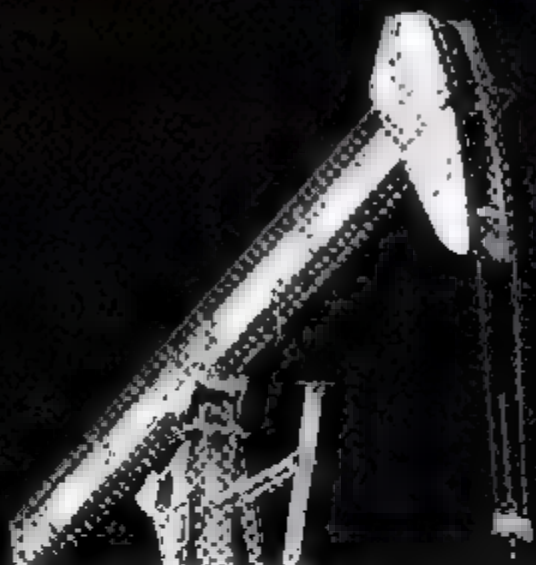
The numbers are staggering: 200 million customers in 100 countries, \$562 billion in deposits, \$1.6 trillion in assets. Citigroup set out years ago to become the world's bank, and the strategy is paying off as \$9 billion out of \$17 billion in 2004 net income came from outside North America, the most the company has ever collected overseas.

CHALLENGE: Different regulatory regimes throughout the world. Recent troubles in Japan and



■ **TRIP** Theoretical years one man's erection would last if he consumed, consecutively, every Viagra pill purchased from Pfizer in 2004.

**AS SOON AS CARS RUN ON A TANK OF GOOSE DOWN,
WE'LL MAKE ONE KIND OF SOFTWARE SOLUTION.**



המחשבה של ה'אני' היא תוצאה של התפתחות המוח והתבונה
והיא לא יכולה להיות אלא תוצאה של התפתחות המוח והתבונה
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7012 5257 (X)0 26659425622 2008 3/6/0



Europe suggests Citigroup is too big to come from Park Avenue. **OPPORTUNITY** Buy Schwab. Cit's recent sale of the Travelers Life & Annuity unit put \$11.5 billion in its coffers. With a few billion more, it could add another market share leader to its portfolio.

37

L-3 COMMUNICATIONS

35

Maximum Security

For defense contractors, the prize used to be a next-gen fighter or missile system. Today it's twofold: a role in Donald Rumsfeld's high-tech military "transformation" and a piece of the home and security pie. L-3, whose products range from aerial drones to high-throughput airport luggage screeners, is succeeding on both fronts. Part communications expert and part military specialist, L-3 is the Terminator of emerging threats.

CHALLENGE Manage rampant growth. L-3's sales have ballooned sevenfold, to \$6.9 billion, in six years. If the company isn't careful, it may soon need a Rumsfeldian transformation of its own.

OPPORTUNITY Secure US ports. As a Coast Guard supplier, L-3 is poised to do the job.

38

AMERITRADE

32

Momentum Trader

Ameritrade has amassed \$76 billion in client assets. That's the

good news. The bad news is that customers keep just 25 percent of their liquid assets in Ameritrade accounts. To push the rest, CEO Joe Moggi has launched Amerinvest, a fee-based service that recommends portfolios of low-cost exchange-traded funds. And to keep the cheapskates around, he's introduced iXline, a platform that charges only \$5 a trade.

CHALLENGE Find a worthy successor. In mastermind Moggi, who is due to leave in September. **OPPORTUNITY** Snap up the online accounts of TD Waterhouse as Moggi is a parting shot.

39

EXELON

31

Next-Gen Generator

The nation's aging nuclear power plants are creaking at the turbines: the last JS Duke built was ordered in 1973. Exelon exploits the industry's woes by buying underperforming plants, overhauling them, and cranking up efficiency. Where the usual nuke operates at 90.7 percent capacity, Exelon's 17 plants average 93.5 percent, the difference added 20 cents to last year's earnings per share. If a \$26.1 billion merger with Public Service Enterprise Group is approved, the company will take on four more plants. As the threat of global warming makes carbon-free atomic power more palatable to the public, Exelon will supply it

and make a healthy profit along the way.

CHALLENGE Opposition to nuclear energy. Exelon will have to step lightly as it boosts capacity.

OPPORTUNITY Spearhead the post-Kysco nuclear build-out. If Exelon runs new plants as efficiently as old ones, its future is assured.

40

BP

40

Black & Green Machine

The energy giant's solar business edged into the black for the first time in 2004, with annual sales of photovoltaic products reaching \$400 million. That's just one sign the company is truly beyond petroleum. BP is also curbing greenhouse gas emissions and boosting energy efficiency throughout its internal operations. One promising initiative: low-cost wireless sensors that monitor oil wells, predict equipment failure on ships, and control heat and light in offices.

CHALLENGE Scraps critics who accuse BP of "greenwashing" making token investments in alternative energy for the PR value. Beefing up commitments to wind and other renewables would help.

OPPORTUNITY Build the infrastructure for the hydrogen revolution. Hydrogen cars won't hit the road until there are fueling stations to serve them. ■ ■ ■



6 THAT MISSED THE CUT

In a world of relentless innovation, only the most agile companies stay on top. These six have had prospects and brilliance, but none have managed to keep pace with shifts in technology and more nimble competitors.

IAC/INTERACTIVECORP

Even when Askjeeves, Diller's Net conglomerate has failed to pan out. Having spun off Expedia and Hotels.com, IAC is becoming heavily in home shopping.

INDITEX

The Spanish just-in-time fashion designer and retailer is excelling worldwide, but it has been severely outflanked in the U.S. by rival H&M.

JDS UNIPHASE

Demand for JDS's optical networking products remains one-fifth of its 2001 peak. The erstwhile big player no longer sets the agenda in net hardware.

LEVEL 3

voice over IP was supposed to save Level 3's cash-burning backbone, but the company lost \$2.6 million last year or a nearly \$1 billion in the two years before that.

RYANAIR

The European discount airline continues to deliver financially but it lacks the vision of its Swiss side counterpart JetBlue.

WPP GROUP

The advertising behemoth's never-ending string of acquisitions is starting to look more like growth for growth's sake than a coherent strategy.



Rackspace — Managed Hosting backed by Fanatical Support

Servers, data center and bandwidth are not the key to hosting enterprise class Web sites and Web applications. At Rackspace, we believe hosting is a service, not just technology.

Fanatical SupportSM is our philosophy, our credo. It reflects our desire to bring responsiveness and value to everything we do for our customers. You will experience Fanatical Support from the moment we answer the phone and you begin to interact with our employees.

Fanatical Support has made Rackspace the fastest growing hosting company in the world. Call today to experience the difference with Fanatical Support at Rackspace.



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SEOUL MACHINE

**Cell phones. Memory chips. Plasma TVs.
How Samsung made Korea a consumer electronics superpower.**

by Frank Rose

Illustration by Laundrymat.tv

EVEN TODAY people talk about the “voluntary motivation” at Gumi. A drab factory town in south-central Korea, Gumi is home to one of Samsung’s biggest plants. A decade ago, the company was best known for budget air conditioners and low-end TVs. Its leader, Kun-hee Lee, had grander ambitions, but when he sent out Samsung’s new wireless phones as his 1995 New Year’s gift, word came back that they didn’t work. So that March he paid a visit to Gumi.

At Lee’s command, the factory’s 2,000 employees donned headbands labeled *QUALITY IS MY PRIDE* and assembled in a courtyard. There they found their entire inventory piled in a heap: cell phones, fax machines, nearly \$50 million worth of equipment. A banner before them read *QUALITY IS MY PRIDE*. Beneath it sat Lee and his board of directors. Ten workers took the products one by one, smashed them with hammers and threw them into a bonfire. Before it was over, employees were weeping.

Ritual purification at the command of a heroic leader is an ancient and powerful tradition in this part of the world. With a few superficial changes, this whole scene could have played in a Zhang Yimou costume epic. Certainly it had the desired effect. After Lee’s visit to Gumi, shoddiness was not an option. Ki-tae Lee, then the Gumi factory manager and now head of Samsung’s mobile telecom division, personally tests new models by hurling them against a wall or dropping them from a second-story window. Once he even ran over a handset with his car. It still worked.

Kun-hee Lee’s ambition was straightforward: He wanted to transform his company into the world’s top consumer electronics brand—the place that makes the coolest stuff. A decade later, he’s just about

done it. Samsung is ranked number 21 among the world’s top brands by the consulting outfit Interbrand, just one notch below Sony. In sales, Samsung has shot to number three behind Matsushita and Sony in consumer electronics and is fighting Motorola for the number two spot behind Nokia in cell phones. Samsung is also the world’s leading manufacturer of flash memory and flat-panel screens, two of the core technologies of the digital era. And it is the most profitable tech enterprise on the planet, with a cool \$1.0 billion in earnings last year—more even than Microsoft.

The bonfire at Gumi was typical of Lee’s style, which is as gutsy as it is dramatic. In the late ’90s, when Korean labor became too expensive, he cut thousands of jobs and built factories in cheaper parts of the world, ignoring business pundits who argued that consumer electronics companies should outsource their components and go into more profitable businesses like content. He poured billions into plants where Samsung would make its own memory chips and LCD screens. Now his gamble is paying off as those technologies fuel a new generation of digital cell phones, video cameras, still cameras, music players, computer monitors, high-definition TVs. As a vertically integrated, globally networked manufacturer, Samsung can produce all these gadgets at low cost and blistering speed. At the same time, it makes money selling components to its competitors. Either way, Samsung wins.

Sony, with its marquee brand and proud history of innovation, has always been the company to beat. But the billions Sony poured into the music industry and the movie business left it hobbled; its technological prowess dulled by media execs too fearful of piracy

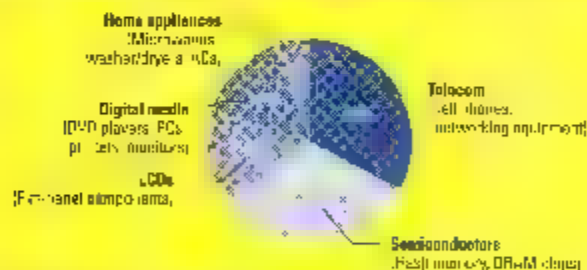
to endorse cutting-edge products. Meanwhile, Samsung moved ahead. The result is in the numbers: Samsung is valued by investors at \$75 billion, while Sony's market cap is roughly half that. As the world moves toward a playground of endlessly replicable slice-and-dice digital media, Samsung—a former also-ran from a small, half-nation wedged uncomfortably between China and Japan—is the company best positioned to get us there.

SEOUL IS A GRITTY, workaday city folded into a rugged mountain range at the butt end of Manchuria. Though home to more than 10 million people, it feels remote. Government economic policies have made South Korea the most connected country on the planet, but just over the horizon is North Korea, where the bomb exists and the Internet doesn't. Everywhere you look in Seoul are neon crosses and Jesus saves signs, testament to the success of Christian missionaries. Almost as ubiquitous is Samsung—not just Samsung Electronics but Samsung Securities, Life Insurance, Petrochemicals, Heavy Industries Engineering, even a Samsung Everland theme park. Together they make up South Korea's leading conglomerate, or *chaebol*.

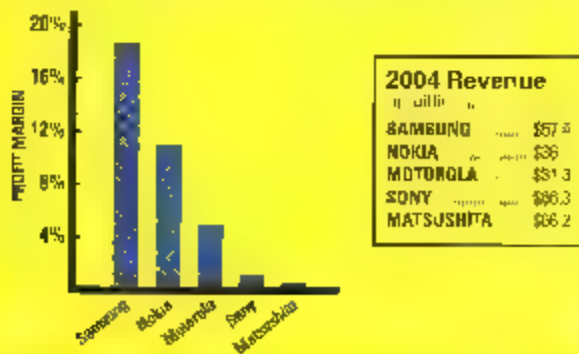
Samsung Electronics sits next to Samsung Life in a steel-and-glass high-rise on a broad boulevard near Namdaemun, the Great South Gate, a 14th-century portal inside an enormous traffic circle. But the company's really run from a mansion several miles away, half-hidden among the wooded slopes of Namsan Mountain. There, near the spectacular new art museum that bears his name, lives Kun-hee Lee.

THE SAMSUNG WAY

The Korean giant produces everything from air conditioners to cool mobile phones at low cost and blistering speed.



...and it pays. Some rivals have more revenue, but Samsung squeezes more profit out of every dollar in sales.



Sources: BGRatings, Samsung, companies

Lee rarely shows up at headquarters; he doesn't have to. At 63, with an estimated net worth of \$4.3 billion, he is the richest and arguably the most powerful man in South Korea. His authority is felt in inverse proportion to his presence. While Confucianism, with its deep respect for order and hierarchy, is prevalent across China and Japan, its most extreme form is found in Korea—and few things are more Confucian than the leader who's so removed as to seem godlike. "He's the invisible chairman behind the scenes, having absolute power and control," an insider says. After the near-disastrous economic meltdown that hit South Korea in 1997, other *chaebol* became more open, like Western corporations. "But Samsung has been able to rebuild itself without jettisoning the old ways. It's a global, mega-corporation that's run as a very old Korean-style company."

Samsung—the name means "three stars" in Korean, three being a lucky number—was founded by Lee's father in the late 1930s as a small exporter of fruit and dried fish. In the '60s and '70s it became a key partner in the government's industrial development drive, venturing not just into electronics but shipbuilding, petrochemicals, heavy machinery and construction. The junior Lee was considered an irresponsible playboy when he took over after his father's death in 1987. Instead, armed with a Japanese economics degree and an MBA from the US, he set out to make Samsung a premium brand, one that like Sony would not have to compete on price.

Clearly, that meant Samsung would have to do better than the cheesy-looking Econo model TV sets it was exporting to countries like Panama. Quality was key, but so too was design. Consumers, Lee realized, must be courted. The obvious place to look for inspiration was Japan, with its rising auto manufacturers and consumer electronics brands. Sony in particular: Lee wanted a "design philosophy" to give his products a common identity, so he hired a Japanese consultant who told him that Samsung's products should be infused with Korean values. But what did that mean? Korea had been systematically purged of its identity during a brutal Japanese occupation that lasted from 1905 to 1945—its language suppressed, its palaces destroyed, its citizens forced to assume Japanese names. Reclaiming a Korean identity would not be easy, even if a Japanese designer said it was the key to Samsung's future.

So the company began a search for places and objects that embody the Korean spirit. Lee himself is said to have identified the key cultural touchstone: Seokguram, a remote mountain grotto that houses an exquisite eighth-century Buddha. He also issued the slogan "Balance of Reason and Feeling" to express Samsung's design philosophy.

It's very Oriental—not black and white, but a balance of things, explains Hyun-joo Song, the executive in charge of design identity. "It states that we will meet the emotional needs of our customers with the technological solutions we have."

In his 1996 New Year's address, Lee proclaimed the Year of Design Revolution. He was referring to design in the broadest sense—not just styling but consumer research and marketing as well. Engineers had once defined new products and decided what features to give them; now specialists in everything from industrial design to cognitive science would take that role. When Lee issued his decree, "most of us

Contributing editor Frank Rose (rose@wiredmag.com) wrote about Comedy Central in issue 13.02.

didn't understand what he was talking about," says Kook-hyun Chung, the senior vice president who heads the Corporate Design Center in Seoul. "Now we understand that we have a new, bigger, broader responsibility."

Just as Lee's design revolution was getting under way, however, disaster struck. First, the market for memory chips—Samsung's one standout success at the time—went into a nosedive, taking the company's profits with it. Then, in October 1997, speculators began a run on the Korean won, which like other East Asian currencies had been weakened by reckless corporate borrowing. Within months the value of the won plummeted by half, interest rates shot sky-high, new loans became impossible to secure, and Samsung deep in debt, faced bankruptcy.

Before the crisis ended, less than a year and a half later, Samsung Electronics would shed 30 percent of its employees—some 24,000 people, most of them factory workers—and eliminate dozens of businesses. The chaebol were expected to keep their employees for life—a tradeoff for government financing and other favors—but Samsung could no longer afford to now that Korean wages had ceased being competitive. "We moved a lot of manufacturing to other areas

China, Malaysia, Mexico, Brazil, Hungary, Slovakia," recalls digital media president Gee-sung Choi at his satellite office in the port city of Suwon, where old factory buildings are giving way to high-rise R&D centers. "And we created a lot of jobs for software and design

AS THE DESIGN REVOLUTION GOT UNDER WAY, DISASTER STRUCK.

engineers. In some way, we have the financial crisis to thank for that."

At first, Lee had to slash capital spending to help pay down debt. Even so, Samsung didn't stop pushing forward. It managed to pioneer the development of SDRAMs, superfast memory chips used in personal computers, and to deliver the specialized memory chip that goes into Sony's PlayStation 2. "Memory is a capital-intensive business that requires continuous investments," says Samsung Electronics CEO and day-to-day decisionmaker, Jong-yong Yun. "The key is in attaining high profit margins through the release of innovative products while maintaining the lowest cost structure." At the end of 1998, the company started spending again. From that point on, Lee bet big on new technology, spending billions on state-of-the-art facilities to build more custom memory chips, flash memory devices, and liquid crystal displays.

Lee made some bad bets during this period as well—most spectacularly, his decision to venture into the automobile business. In 2000, several years and more than \$3 billion later, he unloaded 80 percent of the operation on Renault. By this time, the Korean

economy had recovered and the tech bust had hit the rest of the world, which meant that Samsung Electronics was charging ahead while its competitors were cutting back. The timing could not have been better, since this positioned Samsung to lead the transition in consumer electronics from analog—dominated by Sony and other Japanese companies—to digital.

In 1997, memory was a commodity business and Samsung was a follower in consumer electronics with a few percent market share," says David Steel, the company's marketing chief for digital media, which encompasses everything from PCs to TVs. "The economic crisis forced us to focus on areas where we could lead. If things continue in a linear way, it's hard to catch up. Along comes this disruption: digital technology, flat-panel screens, and it makes a new playing field."

Once the crisis had passed, Jong-yong Yun nimbly executed Samsung's transition from engineering-driven to market-driven. This has meant a heavy reliance on marketing and consumer research, from focus groups to "shadow tracking" of target users over a two-day period. (How do they use the product? How do they manipulate it? What does their facial expression say?) Because Western-style marketing was almost unheard-of when he took over, Yun had to butt heads to make it happen. But Koreans are rarely afraid to mix it up: this is a country where Buddhist monks have been known to attack rival cliques with baseball bats—and Yun's no exception. When Eric Kim, the Korean-American marketing whiz he brought in to make Samsung a top brand, was greeted with ill-disguised hostility by senior executives, Yun announced that anyone who got in Kim's way was dead.

As for Lee, his vindication came at a Tokyo news conference in October 2003. With demand for flat-panel LCDs skyrocketing and Samsung the undisputed king, Nobuyuki Idei, then CEO of Sony, declared he would join with Samsung to produce the most-advanced LCDs ever at a new factory in South Korea. He also announced that Sony, its revenue and profits sliding downward, would finally attempt the cost-cutting moves Samsung had made years before: eliminating jobs, shuttering plants, and shifting much of its manufacturing to China. He also promised to put more focus on semiconductors, rumormongering yet another Samsung strategy. Finally, it was Korea's turn to teach.

IN A SMALL CONFERENCE room just outside the locked doors of the Corporate Design Center in Seoul, Yun-jie Kang is explaining how Samsung came up with one of its hottest products to date: the HL-P5685W, a 58-inch high-definition DLP television with a \$4,200 price tag. Europeans tend to regard humongous TV sets with distaste, and few Asian households have room for one. But in the US, they're just the thing to impress the neighbors at Super Bowl blowouts—and Samsung has become the number-one maker of high-end digital light processing TVs, the sharpest, brightest big-screen option out there. This beauty helps explain why: What's odd about it, apart from the fact that it's nearly 5 feet wide, is that instead of having a horizontal processing engine that simply takes up room beneath the screen, its engine stands upright and serves as a pedestal base. On sale for less than a year, the HL-P5685 and its slightly smaller sister command a \$700 premium over other models and already account for 16 percent of Samsung's DLP sales in the US—far more than anticipated. The company maintains

Coming this summer a \$5,000 progressive-scan version, the world's mos. high-def DLP TV yet.

"When other players were neglecting DLP we got a foothold," says Kang, the model's chief designer, a diffident-seeming man with a trim goatee and a bemused smile. "But then our competitors started catching up, so we had to have something original." To make sure they'd have a DVD player and a home-theater system to match the new TV's sleek lines, Kang's team put their heads together with people from the audio/video division who also work in the Corporate Design Center. No banalization here. With all consumer electronics and computer products reporting to digital media chief Goo-sung Choi, and his designers working side-by-side with appliance and mobile handset designers on four open floors in a building a short walk from headquarters, the walls between business units are literally nonexistent.

This would be remarkable at any company, but it stands in particular contrast to Sony, where Japanese-style consensus management has led to near-paralysis. The difference is instructive, for even though much about Samsung—indeed much about South Korea—is modeled on Japan, it doesn't work like a Japanese company at all.

In fact, much of Samsung's triumph can be traced to its symbiotic relationship with the country it sprang from—starting with South Korea's emergence as an early adopter nation. Korea's government has long used economic policy to encourage development, and its people have responded wholeheartedly. In the '60s, when their country rivaled Ghana on the poverty scale, they eagerly embraced the government's "new village" movement, singing anthems and slinging concrete to build a brighter tomorrow. During the '90s financial crisis, they got equally juiced on its new "knowledge superpower" initiative. Preferential government loans encouraged telecom companies to wire urban areas with Internet connections averaging 20 megabits per second—40 times the speed of broadband in the US.

Today three-quarters of South Korea's households boast a high-speed Internet connection. All this bandwidth has yielded not just PC

hangars, computer parlors where young people gather to play online games, but services like SK Telecom's Cyworld, whose 6 million users create avatars known as "twin me's" and spend real money buying them everything from virtual sports cars to plastic surgery. There's an equally hot mobile market, with intense competition among carriers and handset suppliers alike. "The government has screwed up on a lot of things," says Gilbert Kim, who heads the Korean office of the mobile gaming company Mforma, "but they've done a great job on technology." The result has been an unremitting consumer demand that puts Samsung under constant pressure to outdo itself.

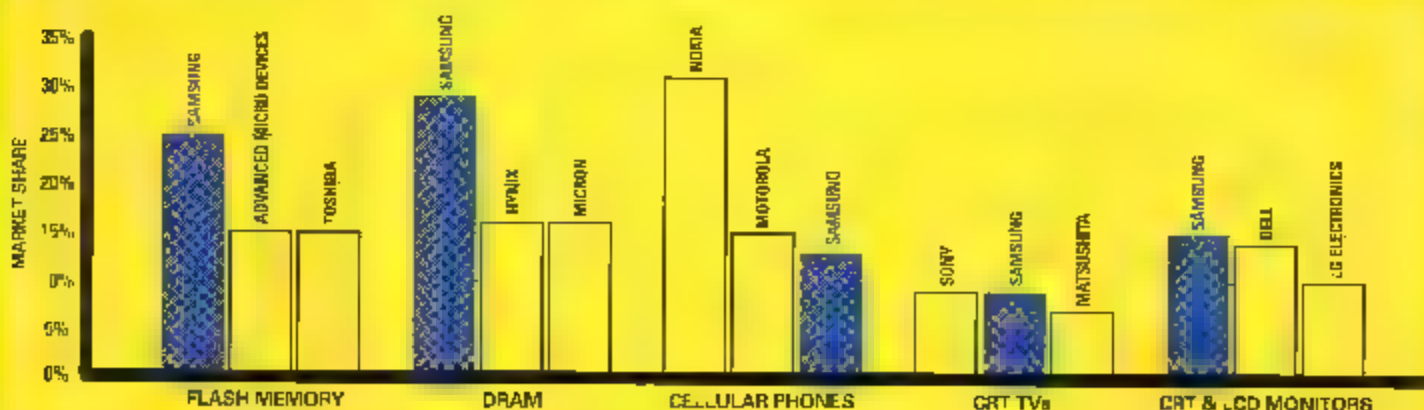
To keep up, Samsung put together an elite CNB Group (short for creating new businesses) to explore long-term social and technological trends that could spark new product lines. CNB is one of Samsung's secret weapons: a team of designers from different business units who look into the future. Ki-seo, Koo, the vice president, who heads the organization, was a TV designer who found his new assignment bewildering at first. "There was no agenda," he recalls.

We were just told to come up with something. Normally you have a road map to follow—you know what's going to happen months from now. But this was blank. Now the unit's 30-odd members develop animated what-if films and 3-D mockups to show top executives how products might be used in some future world. "It's not about what's happening now," Koo says. "It's about imagining what our living environment will be like five or ten years down the road."

But Samsung's most powerful weapon may be Koreans themselves, people like Chi-young Ahn, who leads a team from the mobile telecom division in the Corporate Design Center. A slender thirtysomething wearing charcoal-gray pants and black shirt, his heart-shaped face framed by spiky salt-and-pepper hair, Ahn matches the image Samsung likes to project: sleek, edgy, cool. But with Samsung releasing a new cell phone model every couple of weeks, he doesn't have time to play the hipster. Last fall, his team put together a fashion handset for a Korean carrier that wanted it within weeks, not the usual three or four months. Before that, they created the supersleek 3G videophone

LEADING, OR GAINING FAST

Samsung means "three stars" in Korean, and the company ranks in the top three in a handful of key tech categories



Sources: Gartner, iSuppli

Market share of flash memory and DRAM based on dollar sales; all others based on unit shipments

that hit the streets of Seoul months before Verizon Wireless introduced it in the US as the A890

Almost within Ahn's lifetime, South Korea has risen from dire poverty to become one of the world's most gadget happy nations and his job is to keep up. "Techies get rid of their old phones every six months, fashionistas every year and a half," he explains. "The life cycle of our products is so short that we have to move fast. But we don't think about the extra hours. Then again, neither does anyone in Silicon Valley; the difference is that in Korea, it's not about the stock options." "Cell phones are a cash cow of the Korean economy," Ahn says. "I want to contribute to my country—that's why I do them. My team members feel the same way."

This sentiment is not unusual. The late '90s financial crisis was widely viewed as a Western assault on Korean industry, and during its worst moments, Koreans rallied in reply to a call from Kun-heo Lee and Woo-choong Kim, head of the wildly over-indebted and now-defunct Daewoo Group, to support the won by exchanging their gold for the country's increasingly worthless currency. Some 40,000 Koreans turned in athletic medals, family heirlooms, even wedding rings. The response was so overwhelming that in two days the price of gold fell to its lowest point in more than a decade.

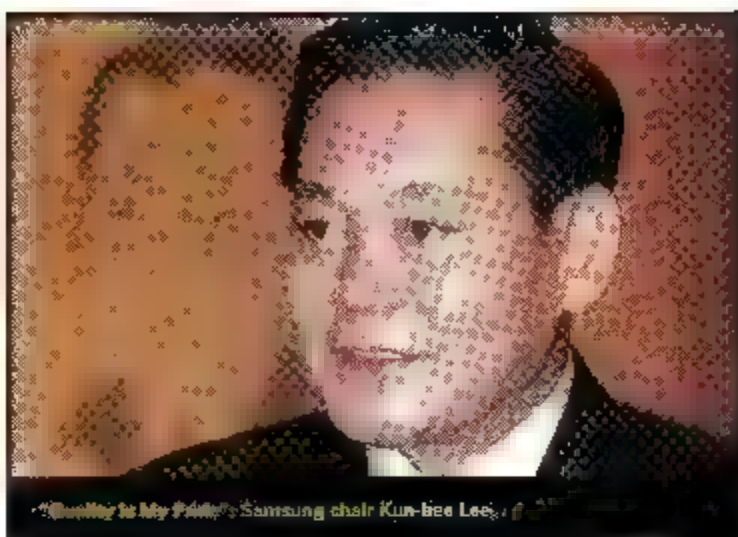
How to explain such behavior? Koreans are very emotional, even in business," observes Joonsuk Kwon, CEO of the mobile gaming company Entelgent and a psychologist by training. It's totally

A 3G PHONE WITH SATELLITE TV! A CREDIT CARD- SIZED CAMCORDER!

opposite from Japan. But that's why Koreans are so motivated. We are one "We're gonna be number one in the world. Americans think, 'Are you crazy or something?' But motivation is a key factor at Samsung—you go to work at 7 am and you leave at 10 pm. People are proud to work there, because it's the elite company I'm proud. When I was living in the US, if you went to a cheap motel, it had a Samsung TV. Now Samsung means quality."

LAST FALL, Samsung demonstrated its prowess in the heart of another country that has long overshadowed its own: China. Shanghai looks entirely computer-generated—sheer glass towers with rocketship crowns, a gleaming skyscraper unfurling at the top like a giant lotus blossom, a glass wing spiraling up from a stone plaza. Zoom in on the spiral, officially known as the Shanghai Science and Technology Museum, on a sunny day in October and you'd have seen some 1,000 people celebrating Samsung's success.

A pep rally for dealers and distributors from every time zone, Samsung's Global Roadshow was part sales extravaganza, part



intraplanetary mind meld for world peace through technology: no Iraq, no North Korea, just boundless faith in the digital future. Scores of hostesses wearing red silk gowns stood in formation as guests glided up the escalators. Onstage, an eager young American with his shirt unbuttoned introduced gadget after gadget: The world's first 3-megapixel camera phone. A camcorder the size of a credit card. A 3G phone that gets satellite TV! The world's smallest multifunction printer! The world's biggest plasma TV. Dazzling technology from South Korea, English as the common language, China as the emerging world super-market—the very definition of now.

The enthusiasm in the crowd was palpable. "What Samsung has done in the past five years is nothing short of amazing," declared Jim Warren of CarToys, a Seattle-based retail chain. Between presentations, "They've elevated themselves to one of the top brands in the world in consumer electronics, and they're the number one cell brand in wireless—particularly with youth. Poor Nokia."

"Japan used to be the benchmark," said D. J. Babani, a Dubai-based distributor who handles Samsung in the Persian Gulf. "Now Samsung has the upper hand, in terms of both technology and design."

"I used to represent Sony, but I switched about four years back," said Farooq Naseem, Samsung's wholesaler in Pakistan. "Frankly, I did not see the value addition anymore. Samsung is defining the future."

Koreans have always struck their neighbors as country bumpkins, and some of the Samsung execs, for all their state-of-the-art gadgets, looked a little out of place amid the lingering colonial decadence and burgeoning capitalist glitter of Shanghai. But this time, they were the stars. Cell phones, home-theater systems, flat-panel TV sets and computer screens, memory chips. North America, South America, Europe, Asia—everywhere you looked, Samsung was winning. The afternoon press conference was full of Chinese reporters eagerly asking CEO Yun how he'd done it. Yun, of course, gave nothing away. The Chinese would have done better to stay for the evening banquet, which was periodically interrupted by entire tables of Samsung execs leaping to their feet as one, slinging back shots of wicked soju (roughly translated as "white lightning"), and shouting "Wee ha yo!" "To us! To us!" It was a sound as defiant and primal as a rebel yell, and equally evocative of determination against all odds. ■ ■ ■

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as it is at green ones? Definitely.

LIFE AFTER DARTH

George Lucas was born to make underground films.
Then a little movie called *Star Wars* lured him to the dark side.
Can the father of the blockbuster really rediscover his avant-garde soul?

BY STEVE SILBERMAN PHOTOGRAPH BY MICHAEL ELINS

Lucas's home in the hills north of San Francisco



GEORGE LUCAS IS DAYDREAMING AGAIN AT HIS DESK.

He looks out the window of the 19th-century house in Northern California he bought 30 years ago, when he was still a young man slaving over a script inspired by the mental image of a dogfight in space. Art and history books line the walls of the room he designed as a personal sanctuary, and there's an editing bay next door networked to servers a few miles away at Skywalker Ranch, the Victorian headquarters of his filmmaking empire. The father of digital cinema is willing to employ technology to serve his own artistic ends, but he does not use email, nor does he surf the thousands of fan sites devoted to the output of his prodigious imagination. The whole rollicking galaxy of *Star Wars* was originally rendered in longhand with a No. 2 pencil.

On May 19 *Revenge of the Sith*, the final installment of that six-part saga, will open on thousands of screens from Chicago to Shanghai after premiering days earlier at the Cannes Film Festival. The epic that has defined Lucas' career is finished, and the director finds himself at a crossroads.

Lucas and his contemporaries came of age in the 1960s vowing to explode the complacency of the old Hollywood by abandoning traditional formulas for a new kind of filmmaking based on handheld cinematography and radically expressive use of graphics, animation, and sound. But Lucas veered into commercial moviemaking, turning himself into the most financially successful director in history by marketing the ultimate popcorn fodder.

Now he has returned to the most private place in his universe to reinvent himself. He could spend the rest of his life capitalizing on *Star Wars*' legacy. Instead he's trying to dream up a second chance to be the rebel filmmaker he aspired to become a long time ago.

I LIKE STAR WARS, BUT I

certainly never expected it would take over my life," Lucas says in a conversation at

Skywalker Ranch. He estimates that he gave two decades of solid work to *Star Wars*, not counting a hiatus to raise three adopted kids as a single father. Now 60, the once lanky wunderkind in aviator glasses has grown bearish, with a snowy, close-clipped beard and a sardonic wit that doesn't come through in the making of documentaries. He says he's relieved that the longest chapter of his career is over.

"Normally at this time, I'd be under a lot of pressure to get the script done for the next movie. There wouldn't be any break from the stress and creative demands. So it's great to be able to kick back."

Those who have seen advance screenings of *Revenge of the Sith* say that the new film—which focuses on the transformation of the petulant and ambitious Anakin Skywalker into the malignan Darth Vader—is more emotionally engaging than the last two prequels, *The Phantom Menace* and *Attack of the Clones*. Lucas' friends observe that he seems happier with this film, which he's been showing off proudly for months in rough-cut form at the ranch. The invitation-only audiences have included many illustrious peers from his film school days, including the directors Steven Spielberg and Matthew Robbins, writer-producer Hal Barwood, and Walter Murch, winner of two Academy Awards in 1987 for film editing and sound on *The English Patient*.

But Lucas won't be kicking back for long. Even as he plans a creative reboot, he faces a backlog of dozens of projects awaiting his supervision as head of Lucasfilm. First is executive-producing *Red Tails*, a movie about a group of African-American fighter pilots known as the Tuskegee Army, who were excluded from the US Army Air Corps until 1940 and then flew 1,500 missions in World War II without losing a single plane. A fourth episode of the Indiana Jones story will move forward as soon as Lucas, director Spielberg, and returning hero Harrison Ford sign off on a script.

And Lucas isn't quite done fiddling with *Star Wars*. Two more TV spinoffs are in the

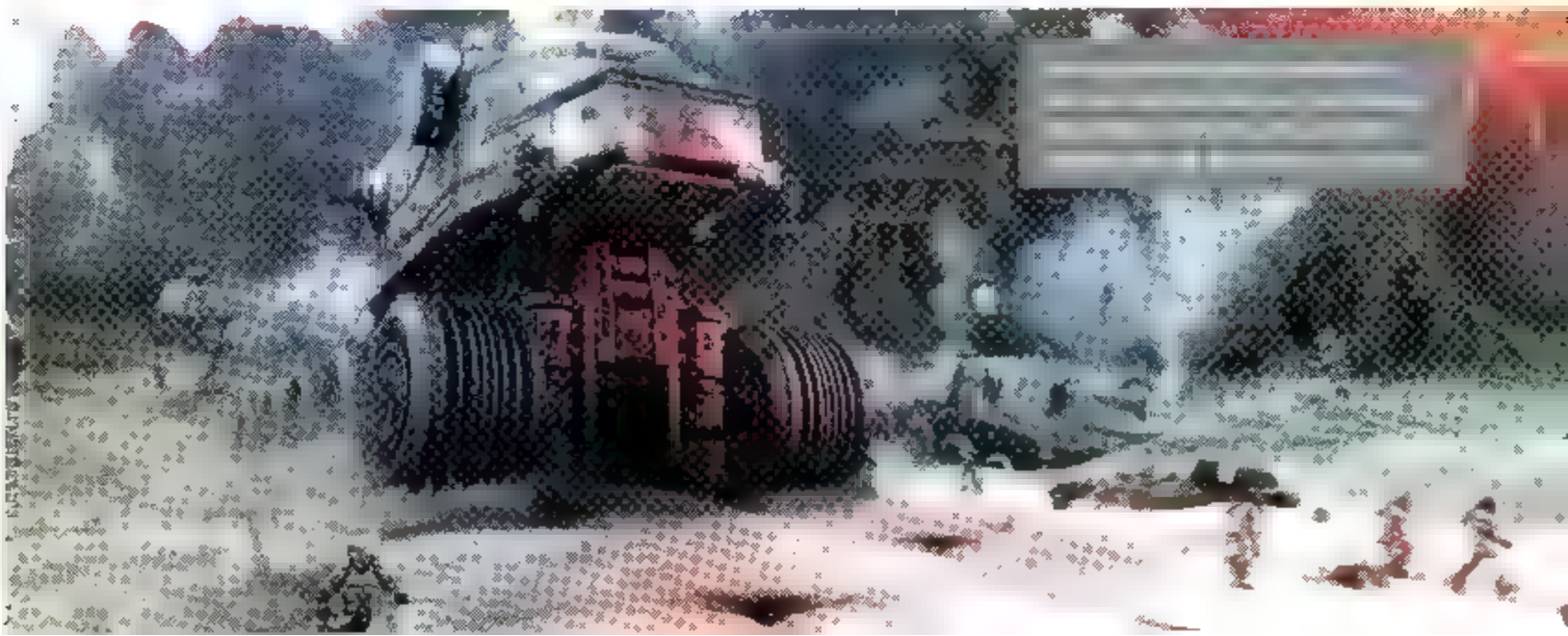
works—one a live action series, the other in the vein of Cartoon Network's *Clone Wars*—plus he's overseeing yet another rerelease of all six films, this time digitally remastered in 3-D. Then there's Lucasfilm's animation unit, which is incubating ideas for its first full-length feature. A documentary team is producing shorts on the lives of historical figures to accompany the DVD release of the TV series *The Young Indiana Jones Chronicles*. Lucas is also developing two new TV series—"one about the future, and one about media," he says, adding that they'll be controversial and hard to get on the air.

Even if Lucas' personal imprimatur turns out not to be enough to put these shows on TV, he has little reason to worry about keeping his empire in the black. With an infusion of *Sith* tie-ins from Lego, Topps, Cingular, and Hasbro, Lucas' digital domain is poised to survive long after General Grievous Pez dispensers are collecting dust under beds from here to Coruscant.

Now Lucas says he is determined to leverage that security to make the kinds of movies that no one expects from him. He claims to have a stack of ideas piling up on his desk for "highly abstract, esoteric films even more daring than his '87 debut, *THX 1138*. An expansion of one of Lucas' student projects at the University of Southern California, *THX* anticipated the cyberpunk aesthetic of William Gibson's *Neuromancer* and Ridley Scott's *Blade Runner*, depicting a pharmaceutically numbed society of the future under constant video surveillance. After Lucas spent a year digitally restoring the film for its theatrical rerelease and DVD debut in 2004, a longtime employee observed: "I've never seen George so excited by any other project at the company." Lucas says the restored *THX* was just a preview of even edgier films to come that he will finance and direct himself.

Illustration by David S. Hernandez

Special feature in issue 13



"I've earned the right to just make things that I find provocative in my own way" he says. "I've earned the right to fail, which means making what I think are really great movies that no one wants to see."

If earning the right to make movies no one wants to see seems like a dour forecast for the next phase of his career, it may be because Lucas has never felt at ease with his own mainstream success. For the past couple of years, he's been telling interviewers that the breakout popularity of *American Graffiti* in 1973 "derailed" him into the business of mass-market filmmaking and that his career was "sidetracked" by *Star Wars*.

His ambivalence about presiding over a commercial empire has even led him to identify with his arch-villain Darth Vader. In the career retrospective included with the 2004 *Star Wars* DVD set, Lucas declares: "I'm not happy that corporations have taken over the film industry, but now I find myself being the head of a corporation, so there's a certain irony there. I have become the very thing that I was trying to avoid. That is Darth Vader — he becomes the very thing he was trying to protect himself against."

Though Lucas says he's looking forward to "a whole new adventure" as a director of "very out-there" films, he admits that he faced this crossroads at least once before and chose to go down the more familiar route of erubescing Darth Vader's backstory. Now he'll have to tap his inner Luke again — the searcher eager to leap into the unknown. But if the father of *Star Wars* isn't the real George Lucas, who's the man behind the mask?

THE POPULAR MYTH OF LUCAS Life is that he grew up as the son of a conservative businessman in Modesto, California, and became obsessed with car racing until his teenage dreams of being a professional driver were cut short in 1962 by a near-fatal accident. With little interest in cinema beyond *Flash Gordon* serials and *Adventure Theater* reruns on TV, he went off to film school, emerging after *American*

Graffiti as the architect of the Blockbuster That Ate Hollywood.

Lucas himself has been the primary author of this version of events. When I went to USC I didn't know anything about movies," he told a Canadian film crew in 2002. "I watched television. I wasn't that interested in movies."

While this kind of talk suits Lucas' image as an ordinary billionaire in a flannel shirt who wanted to upgrade the old-fashioned cliff-hanger so generations of kids could learn to dream again, it obscures the crucial part of his life when he first glimpsed his own destiny. Understanding these early years not only casts light on Lucas' current yearning to make experimental films, it reveals the frustrations that drove a self-proclaimed Luddite to finance the creation of digital tools that forever changed the craft of moviemaking.

Like the journey of Luke Skywalker, the journey of Lucas the filmmaker began with a cryptic transmission that hinted at the existence of a universe more vast than the one he grew up in. While he was sipping his souped-up Fla. through the dusty Central Valley flatlands that provided the model for Luke's home planet of Tatooine, another kind of momentum was building to the north in San Francisco, where poets and painters were picking up Army surplus hand-held 16-mm cameras to launch the first wave of independent cinema on the West Coast.

A filmmaker named Bruce Baillie tacked up a bedsheet in his backyard in 1960 to screen the work of indie pioneers like Jordan Belson, who crafted footage of exploding galaxies in his North Beach studio, saying that he made films so life on Earth could be seen through the eyes of a god. Filmmakers Stan Brakhage and Bruce Conner had equally transcendent ambitions for the emerging medium. Brakhage painted directly on film and juxtaposed images of childbirth and solar flares, while Conner made mash-ups of stock footage to produce slapstick visions of the apocalypse. For the next few years, Baillie's series, dubbed Canyon Cinema, toured local coffeehouses where art films

shared the stage with folksingers and stand-up comedians.

These events became a magnet for the teenage Lucas and his boyhood friend John Plummer. As their peers cruised Modesto's Tenth Street in the rites of passage immortalized in *American Graffiti*, the 19-year-olds began slipping away to San Francisco to hang out in jazz clubs and find news of Canyon Cinema screenings in flyers at the City Lights bookstore. Already a promising photographer, Lucas embraced these films with the enthusiasm of a suburban goth discovering the Velvet Underground.

"That's when George really started exploring," Plummer recalls. "We went to a theater on Union Street that showed art movies, we drove up to San Francisco State for a film festival, and there was an old beatnik coffeehouse in Cow Hollow with shorts that were really out there." It was a season of awakening for Lucas, who had been a D-plus slacker in high school. A creative writing teacher at junior college in Modesto opened his eyes to the pleasures of reading, which led him to the writings of Joseph Campbell, a decisive influence on *Star Wars*.

Then Lucas and Plummer migrated south, where they discovered another filmmaking revolution in progress. They made pilgrimages to the New Art Cinema in Santa Monica to take in Jean-Luc Godard's *Breathless*, François Truffaut's *Jules et Jim*, and Federico Fellini's *8 1/2* — movies that used hand-held cinematography and in-your-face editing to deliver life unfiltered through the stale conventions of the Hollywood studios.

At an autocross track, Lucas met his first mentor in the film industry: famed cinematographer Haskell Wexler, a fellow aficionado of sleek racing machines. Wexler was impressed by the way the shy teenager handled a camera, cradling it low on his hips to get better angles. "George had a very good eye, and he thought visually," he recalls.

By the time Lucas entered film school in 1964, he was already on his way to becoming

THESE MOVIES WERE AN AWAKENING FOR LUCAS, WHO HAD BEEN A D-PLUS SLACKER IN HIGH SCHOOL.

the director who would combine the visceral excitement of *Flash Gordon* with the visual language of transcendence.

AT USC, LUCAS JOINED THE FIRST generation of film students who were influenced more by the explosion of world cinema than by the silver screen canon. One of his classmates, John Milius, the future cowriter of *Apocalypse Now* and director of *Red Dawn*, introduced him to the epics of Akira Kurosawa, whose depictions of Japanese feudal society were a key influence on *Star Wars*.

Lucas' sense of his own mission crystallized in animation classes and in a course called Filmic Expression, which focused on the non-narrative aspects of filmmaking: telling stories without words by using light, space, motion, and color. The professors screened animated shorts and documentaries sponsored by the National Film Board of Canada, which has been funding cinematic exploration since the 1940s.

The work of three Canadian directors in particular excited Lucas about the potential of experimenting with the tools of filmmaking. An animator named Norman McLaren explored novel ways of creating images and sounds with every film he made, mixing human actors, animation, and special effects as Lucas would do digitally 20 years later. Lucas was also impressed by the documentaries of Claude Jutra, who used the artistic strategies of Godard and Truffaut to tell real-life stories. One of the reasons the first *Star Wars* film seemed so vivid compared with previous sci-fi fare, Lucas explains, was that he shot it like a Jutra documentary, covering the scenes with multiple cameras and staging them loosely on purpose so they would unfold with an edge of spontaneity. (Another reason was the early insouciance of Harrison Ford and Carrie Fisher, blissfully unaware that they were about to become action figures.)

The film that made the most profound impression on Lucas, however, was a short called *21-87* by a director named Arthur Lipsett, who made visual poetry out of film that others threw away. Working as an editor at the National Film Board, he scavenged scraps of other people's documentaries from trash bins, intercutting shots of trapeze artists and runway models with his own footage of careworn faces passing on the streets of New York and Montreal. What intrigued Lucas most was Lipsett's subversive manipu-

UNDER THE INFLUENCE

NEIGHBOURS (1952)

An iconic sci-fi horror sprouts in the property-line war between two houses, and chaos ensues. By animating humans with a swiftness and grace that would "parallel" Mr.alien created a world in which the laws of gravity and physics were suspended, proving to Lucas that the only limit in cinema was in the filmmaker's imagination.



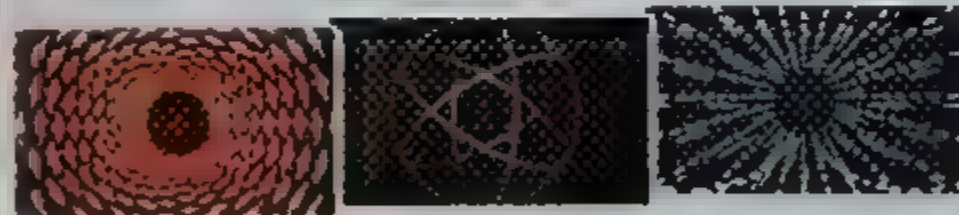
21-87 (1963)

Lapsed filmmaker turned editor and up to an art by manipulating found footage and audio, inspiring Lucas to become an editor and director. Visual compositions such as the "swirling star" sequence in *Star Wars* are a direct result of Lucas' first feature film, which was a profound influence on *American Graffiti* and *Star Wars*—as well as the source of the "swirling star" sequence.



ILLUSIONS (1961)

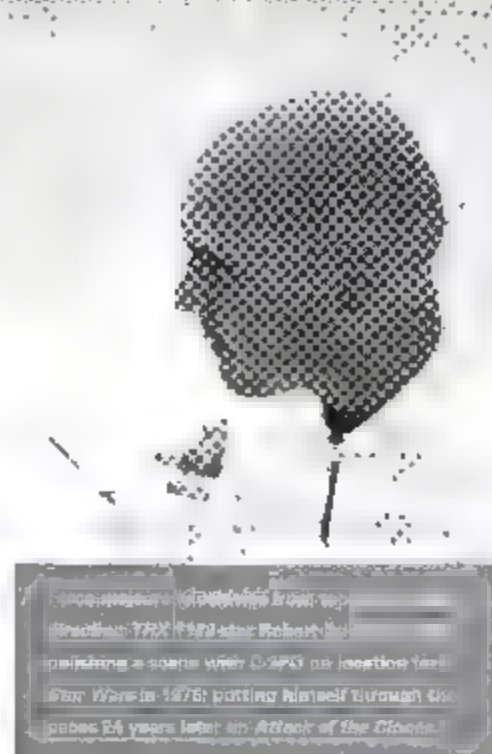
A student of Buddhism and yoga, Besson "could extract 10 times the beauty from the reflections of the hood of a 1949 Buick" says *THX 1138* collaborator Walter Murch. The religious director's images of swirling stars and other celestial patterns in *Illusions* and later created visual poetry for *The Night Stuff*, which had abstract scenes like Besson's "swirling star" sequence. He designed the close-ups of gladiators fighting in the arena for the 1961 film *Gladiator* and the 1962 film *The Gladiators*.



THE HIDDEN FORTRESS (1959)

Lucas credits the hulking subkicks in this film with inspiring the droids. *THX 1138* and *21-87*, but that's not the most obvious influence on *Star Wars*. The film's director, Kurosawa, was a visual storyteller who provided the "visual poetry" that Lucas and his collaborators used to create the film. Kurosawa's influence is also evident in the film's use of the "swirling star" sequence, which was a direct result of Lucas' first feature film.





lation of images and sound as when a shot of teenagers dancing was scored with labored breathing that might be someone dying or having an orgasm. The sounds neither tracked the images nor ignored them—they rubbed up against them. Even with no plot or character development, *21-87* evoked richly nuanced emotions, from grief to a tenacious kind of hope all in less than 10 minutes.

Lucas threaded the film through the projector over and over, watching it more than two dozen times. In 2003, he told directors Amelia Does and Dennis Mohr, who are making a documentary on Lipsett: *21-87* had a very powerful effect on me. It was very much the kind of thing that I wanted to do. I was extremely influenced by that particular movie." Deciding that his destiny was to become an editor of documentaries who, like Lipsett, would make avant-garde films on the side, Lucas worked in the USC editing room for 12 hours at a stretch, living on Coca-Cola and candy bars, deep in the zone.

When George saw *21-87*, a lightbulb went off, says Walter Murch, who created the densely layered soundscapes in *THX-1138* and collaborated with Lucas on *American Graffiti*. One of the things we clearly wanted to do in *THX* was to make a film where the sound and the pictures were free-floating. Occasionally, they would link up in a literal way but there would also be long sections where the two of them would wander off and it would stretch the audience's mind to try to figure out the connection."

To simulate a realistic society of the future on a shoestring budget for *THX*, Lucas and Murch pushed that audiovisual disconnect as far as they could. A scene in which the hero (played by a young Robert Duvall) is tortured is made more horrific by the banal chatter of his offscreen tormentors; the chatter of unidentified voices throughout the film reinforces the idea that, in a world of ubiquitous surveillance, you are never alone.

"Walter and I were working simultaneously so I could react to his sounds and recut the film according to what he was doing," Lucas

says. "We were inspiring each other as we went, rather than just doing the picture and attaching sounds to it. That's the way I've worked since then." While he was writing the first *Star Wars* script, Lucas hired USC student Ben Burt to make the Imperial Star Destroyers sound more ominous by adding the sputtering, rumble of an air conditioner; a barely perceptible jangle of spurs was slipped under Boba Fett's entrance in *The Empire Strikes Back*.

Lucas never met the young Canadian who influenced him so deeply. Lipsett committed suicide in 1986 after battling poverty and mental illness for years. But, like a programmer sneaking Tolkien lines into his code, Lucas has planted stealth references to *21-87* throughout his films. The events in the student-film version of *THX* took place in the year 2187, and the numerical title itself was an homage. In the feature-length version, Duvall's character makes his run from a subterranean city when he learns that the love of his life was murdered by the authorities on the date "21/87." And in the first *Star Wars*, when Luke and Han Solo blast into the detention center to rescue Princess Leia, they discover that the stormtroopers are holding her as a prisoner in cell 2187.

The rabbit hole goes even deeper. One of the audio sources Lipsett sampled for *21-87* was a conversation between artificial-intelligence pioneer Warren S. McCulloch and Roman Kroitor, a cinematographer who went on to develop Imax. In the face of McCulloch's arguments that living beings are nothing but highly complex machines, Kroitor insists that there is something more: "Many people feel that in the contemplation of nature and in communication with other living things, they become aware of some kind of force, or something behind this apparent mask which we see in front of us and they call it God."

When asked if this was the source of the force, Lucas confirms that his use of the term in *Star Wars* was an echo of that phrase in *21-87*. The idea behind it, however, was

universal. "Similar phrases have been used extensively by many different people for the last 13,000 years to describe the life force," he says.

The lessons Lucas learned from filmmakers like Lipsett, McLaren, Jura, and Kurosawa helped shape the creation of all of his later work. "My films operate like silent movies," he explains in an unused portion of an interview for a documentary on editing called *Edgecodes.com*. "The music and the visuals are where the story's being told. It's one of the reasons the films can be understood by such a wide range of age groups and cultural groups. I started out doing visual films—tone poems—and I move very much in that direction. I still have the actors doing their bit, and there's still dialog giving you key information. But if you don't have that information, it still works."

Hollywood in 1971, with *THX-1138*, the Empire struck back.

Convinced that the stark, stylish film had no commercial potential, a team of Warner Bros. executives snatched control of *THX* from Lucas, recut it, and hung it out to dry in a handful of B-list theaters. The studio then backed out of its deal with Francis Ford Coppola's independent production company, American Zoetrope, which had financed the film, nearly putting Coppola out of business. In 1973, when Universal threatened not to release Lucas' *American Graffiti*, which became one of the biggest moneymakers in film history, Lucas vowed to build his own rebel base far from Hollywood.

Armed with the success of the first two *Star Wars* movies, Lucas built his ranch in Marin County and launched a massive R&D blitz to extend a director's editorial control over not just a film's pacing and choice of shots but every element inside the frame as well.

If you want to know what editing was like before George came along, visualize this: a warehouse at the end of *Raiders of the Lost Ark*, says Michael Rubin, author of *Droidmaker: George Lucas and the Digital*

HIS NEW FILMS MADE FRIENDS ASK IF THE MASTER OF TECHNOLOGY HAD BECOME ITS SLAVE.

Revolution which will be published this fall "If you shot a movie like *Star Wars*, you had 300,000 feet of film and sound rolls that had to be code-numbered and matched by hand. If you wanted to cut the scene where Luke was doing this and Han Solo was doing that, some poor schmuck had to find those pieces so you could fit them together with tape. It was like the Library of Congress with no abracadabra."

EdiDroid, the digital-editing system that Lucas' team of engineers invented in the 1980s, replaced this Sisyphean task with film scanners, a searchable archive, and a drag-and-drop interface. Soid to Avid, it has become the core of the technology used to edit most major studio releases and nearly all prime-time TV programs today. Meanwhile, the brainstorming of his computer division produced the 3-D rendering software that spun off into Pixar Animation Studios. Lucas' i/x house, Industrial Light & Magic, made computer graphics the center piece of big-budget moviemaking with *Jurassic Park* and *Terminator II*. And the improvements in audio clarity and theatrical sound pioneered for *Star Wars* (including a set of standards known as THX Certification) resulted in massive sonic upgrades not only at the local mall, but in surround sound systems at home.

The result of these efforts gave Lucas, not what he'd been looking for back at USC. He could flood the screen with color as Brakhage did, mix real and animated elements like a McLaren, manipulate shape and scale with the fluidity of a Beeson, and make montages of any image and sound that he could imagine. Reincarnated as a cluster of menu items, the avant-garde techniques that inspired Lucas to become a director are now available to any filmmaker.

Everything George has done has been to reduce the distance between what's in his skull and the pixels on the screen," Rubin observes. "He's really a painter."

Among the new generation of filmmakers who use the tools developed at Lucasfilm is Peter Jackson, the director of his own epic

trilogy. "I was obsessed by visual effects and in the year prior to *Star Wars*, *Logan's Run* and the *King Kong* remake had come out," he says. "The world of those films was the one I thought I would have to work in—a world in which your imagination was limited by the technology. Then *Star Wars* came out in 1977 and blew my mind. Quite apart from being the 16-year-old kid standing and cheering at the end, I knew that if I was ever to achieve my filmmaking aspirations, I no longer had to be limited by technology."

Jackson finally met his hero when the production schedules of *The Lord of the Rings* and *Attack of the Clones* overlapped in Sydney. As a fellow techie, he was blown away by the size of Lucas' monitors. "I was used to peering at my little 12-inch screen to watch our shooting, and George had two 42-inch plasmas. The thing I remember most was us discussing 'Where to from here?' in cinema technology. That's a true visionary—someone who is always thinking about what's next and making it happen."

By the time Lucas got around to making *The Phantom Menace* and *Attack of the Clones*, however, even longtime fans and colleagues started asking if his focus on technology had become, as Thoreau put it, an improved means to an unimproved end. While the original film had the scruffy vitality of a garage band making its big break, the recent episodes can seem like a whirlwind tour of Industrial Light & Magic's interplanetary showroom.

"For me, those films pummeled you into submission," March says. "You say, OK, OK, there are 20,000 robots walking across the field. If you told me a 14-year-old had done them on his home computer, I would get very excited, but if you tell me it's George Lucas—with all of the resources available to him—I know it's amazing but I don't see it's amazing. I think if George were here and we could wrestle him onto the carpet, he'd say, 'Yeah, I've gotten into that box, and now I want to get out of that box.'"

THE SUMS UP THE THEME OF ALL HIS WORK: "TAKE CHARGE OF YOUR LIFE AND DO DANGEROUS THINGS." to get out of the box has more alphas than he may realize. Film critic Roger Ebert is already intrigued by the possibility of the director of *Star Wars* maturing beyond his well-worn role of being a dreamweaver for kids. "Lucas is obviously great at science fiction, and he could combine his indie origins with his natural inclinations in smaller-scale sci-fi films," he says. "There's a lot of mind-bending speculative fiction by Robert Heinlein and Isaac Asimov that has never been filmed. A movie like *Eternal Sunshine at the Spotless Mind* is science fiction, though it was never described that way."

While Lucas promises that his new films will tackle philosophical issues ranging from theology to slavery in contemporary society, he says they'll be "short projects. Like normal people do. You shoot a few months, they're finished in a year, and if you want to do another one, you still have time off."

Given a powerful enough vision, as Yoda might say, size matters not. A 32-year-old former coder named Shane Carruth walked away with the Sundance festival's coveted Grand Jury Prize last year for a knotty thriller on the subject of time travel, called *Primer*. Total cost of production: \$7,000.

One hurdle to Lucas' thinking small, however, is it isn't easy to downscale your ambitions when you believe that you not only inadvertently financed the multiplexing of America but that you're also indirectly responsible for the popular successes of indie films like *Lost in Translation* and *Amélie*.

"After *Star Wars*, *Jurassic Park*, *The Godfather*, and *The Exorcist*, all the giant blockbusters, half of the money went to the theaters, and we went from about 15,000 screens to about 35,000 screens," Lucas says. "The crux of the movie business is the crux of any business—shelf space." With all those new screens, he believes "hundreds of esoteric art films are now being financed by companies like Miramax and reaching audiences that would never have seen them before. You end up with a much more varied group of films being available to you than in the '60s."

HE SUMS UP THE THEME OF ALL HIS WORK: "TAKE CHARGE OF YOUR LIFE AND DO DANGEROUS THINGS."



He's right that the post-Jaws blockbusters, including his own, financed the morphing of the neighborhood movie palace into the corporate googolplex. But he's wrong about what's playing there, says Dade Hayes, author of *Optic Nerve: How Hollywood Box Office Became a National Obsession*. "It's true that a certain tier of art-house product would never have seen the light of day a generation ago. That's supercool if you're living in L.A., Boston, or New York, but in most of the big-grossing complexes, you're just going to get more showtimes of *Shrek 2*."

Fortunately for indie filmmakers, there's a counterforce: the marriage of the DVD and the Internet. Companies like Film Movement, CineCruz, and Netflix are boosting sales of independent films by offering choices and targeting online ads to users likely to rent niche fare. More people saw Nim Caro's *Whale Rider* on DVD and VHS than in theaters, adding \$.3 million in rentals to the film's US box office of \$21 million—a serious money for a movie by a first-time director. Netflix alone generated 630,000 of these rentals by promoting *Whale Rider* to its 2.3 million members based on user recommendations.

While Lucas has been predicting for years that online distribution would finally free filmmakers from the death grip of Fox and Paramount, now—at the moment of its

emergence—he still seems firmly attached to the old theatrical model and a Hollywood sense of scale.

"With film, if you get a million people to see your movie on the first weekend, you've made about \$6 million. That basically will not end up on the 'top 10 chart,'" he told me.

You have to get 10 million people on the first weekend. And if you don't do it in two days, you're basically out of the theaters and into the DVD market. There's just an ecology there. If you're a mouse, don't expect to kill a lion, because it ain't gonna happen. If you want to have that kind of power, it's better to be a lion because the mice are fine—you can have a life and everything—but the lions are the ones out there prowling and scaring the hell out of everybody."

That's the voice of his inner Vader—never wanting to be seen as less than a lion and keeping him busy with everything but the films he says he truly wants to make. Reinvention in midcareer is not a luxury that most directors can afford. Lucas' hard-won and cautiously managed prosperity not only earns him the right to fail, it gives him a chance to succeed in ways that his role models were denied. For the old pros who taught Lucas his craft at film school—a return to a more personal style of filmmaking by

one of their most prestigious alumni would be greeted as an artistic homecoming.

"I'm proud of George, but I'm worried about him," says Lucas' former cinematography instructor, USC professor emeritus Woody Omens. "He was trying to speak a different cinematic language at an early point in his career, and he's still trying to get to that. If he wanted me to mentor him again 40 years later, I would say, 'Let go. Do something that explores the non-narrative side of human expression from the perspective of a master and a veteran. Go and make the movie of your life.'"

The myth of Luke Skywalker hinges on courageous acts of liberation. In our conversation at the ranch, Lucas sums up the central theme of his films from *THX 1138* to *Revenge of the Sith*: "How do you personally get to the point where you wake up out of your stupor and take charge of your life and do dangerous and scary things?"

Now that Lucas' odyssey in the land of droids and Wookiees is over, he has an opportunity to tap the bravery of the younger self who mapped out a universe at his desk with a No. 2 pencil. The masters of independent cinema and the digital rebels, assembled outside the gates of Skywalker Ranch to deliver a message: "Lucas, trust your feelings." ■ ■ ■

Robert Hurbert

The Dig

The Inspiacy

Star Wars
Knights of the
Old Republic 2003

Kubavasi

James Hahn

Frank Darabont

The Green Mile
1999

David Letterman

The Young Indiana
Jones Chronicles 1992Indiana Jones and the
Last Crusade 1989

David Fisher

A Doctor's Progress 1999

Barry Levinson

David Fincher

Starship Troopers

Chris Columbus

Harry Potter
and the Sorcerer's Stone 2001

Forrest Gump

Harry Potter
and the Chamber of Secrets 2002

Saving Private Ryan

Toy Story 1995

Renaud Man

Tom Hanks

Steve Jobs

Titanic 1997

James Cameron

Dariusz Dabrowski

Maddalena
Galactica 1999Terminator 2
Judgment Day 1991

The Godfather: Part II 1974

The Godfather: Part I 1972

THE NEW HEART OF THE EMPIRE

Lucas built his past glory at a hidden fortress called Skywalker Ranch. At his brand-new gaming/effects factory he's creating the future.

BY JESSIE SCANLON

PHOTOGRAPHY: EDUARDO



INSIDE GEORGE'S FUTURE FACTORY

The gaming + effects + film studio of tomorrow

WORKSTATIONS

Offices for Lucasfilm marketing, licensing, and online ventures, plus work areas for Industrial Light & Magic employees.

The 350-seat theater can screen film or digital files at 2,048-pixel resolution (4K in the future). It sits on a raised slab, which isolates the projection room from vibrations.

CHILD CARE CENTER PLAYGROUND

DATA CENTER

The hub of the new U.S. Digital Arts Center and the workshop for LucasArts and ILM artists is a 13,500-square-foot room, roughly three basketball courts, houses thousands of servers that handle rendering, data storage, and network services like email. With capacity for 14,000 processors, the center can move 1,000 terabytes of data a day across the building's 10-gigabit fiber network.

VIDEO DATA CENTER

Racks of specialized servers designed for high-speed compositing and transfer between digital cameras, digital theaters, and nine desktop viewing stations.

TRAINING CENTER

Artists learn to use tools in development.

Offices for Lucasfilm marketing, licensing, and online ventures, plus work areas for Industrial Light & Magic employees.

Child Care Center
Open to the public

OFFICES

Want to feel the Force every day? There are 170,000 square feet of space for lease.

RESTAURANT

Open to the public.

PUBLIC PARK

The grounds were designed by Lawrence Halprin, the landscape architect behind the FDR memorial in Washington, DC. He also restored San Francisco's Ghirardelli Square.

GARAGE

Underground lot with 1,500 spots.

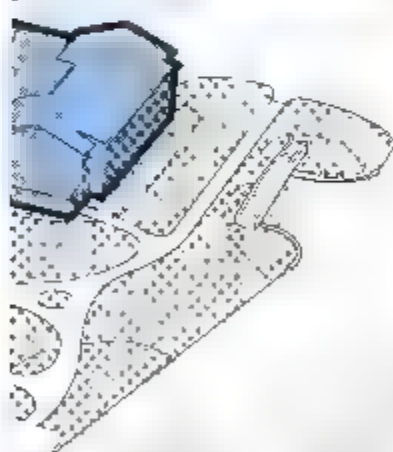
BACKUP POWER

An uninterruptible power supply and backup generators keep the data center running in case of power outage.

Thirty-four cameras, plus a 3-D stereo photography rig, line the 1,600-square-foot stage. A giant door accommodates large-scale models, and a 180-degree blue screen allows directors to capture images and composite them against a digital background in real time. There are plans to double the number of cameras.

Located in the stable center of the building on poured slab, this room is insulated from the vibrations and noise of passing traffic.

OFFICE SUITE
Fifteen rooms can be reconfigured on the fly for editing, compositing, audio mixing, or digital color timing.



gaming/film effects facility the same way he makes a movie—with a sweeping vision, an obsessive eye for detail, and a geek's reliance on computers. The 3-D simulations of the new San Francisco campus rivaled any of the pre-visualizations of Coruscant produced for the final chapter of the *Star Wars* saga.

Architects created digital depictions of the lobby, soundstage, theater, and every room or office, realistic down to the fabric on the chairs and the lumens of the lightbulbs. Even the auteur, Lucas, approved each rendering himself—reviewing four or five possible setups for every site before picking his favorite.

When the production wraps in July, some 1,500 employees will move into the 850,000-square-foot, \$350 million set that is the Letterman Digital Arts Center. Located on the former Presidio army base, the campus is a coming-out, a move away from Lucas' secretive Skywalker Ranch and stealth office park in San Rafael, California, to a public park at the base of the impossibly unstealthy Golden Gate Bridge. Named after the hospital that formerly occupied the site, Letterman brings together three arms of the Empire that have long been separate: Industrial Light & Magic, the effects division; LucasArts, the gaming branch; and Lucasfilm's marketing, online, and licensing units.

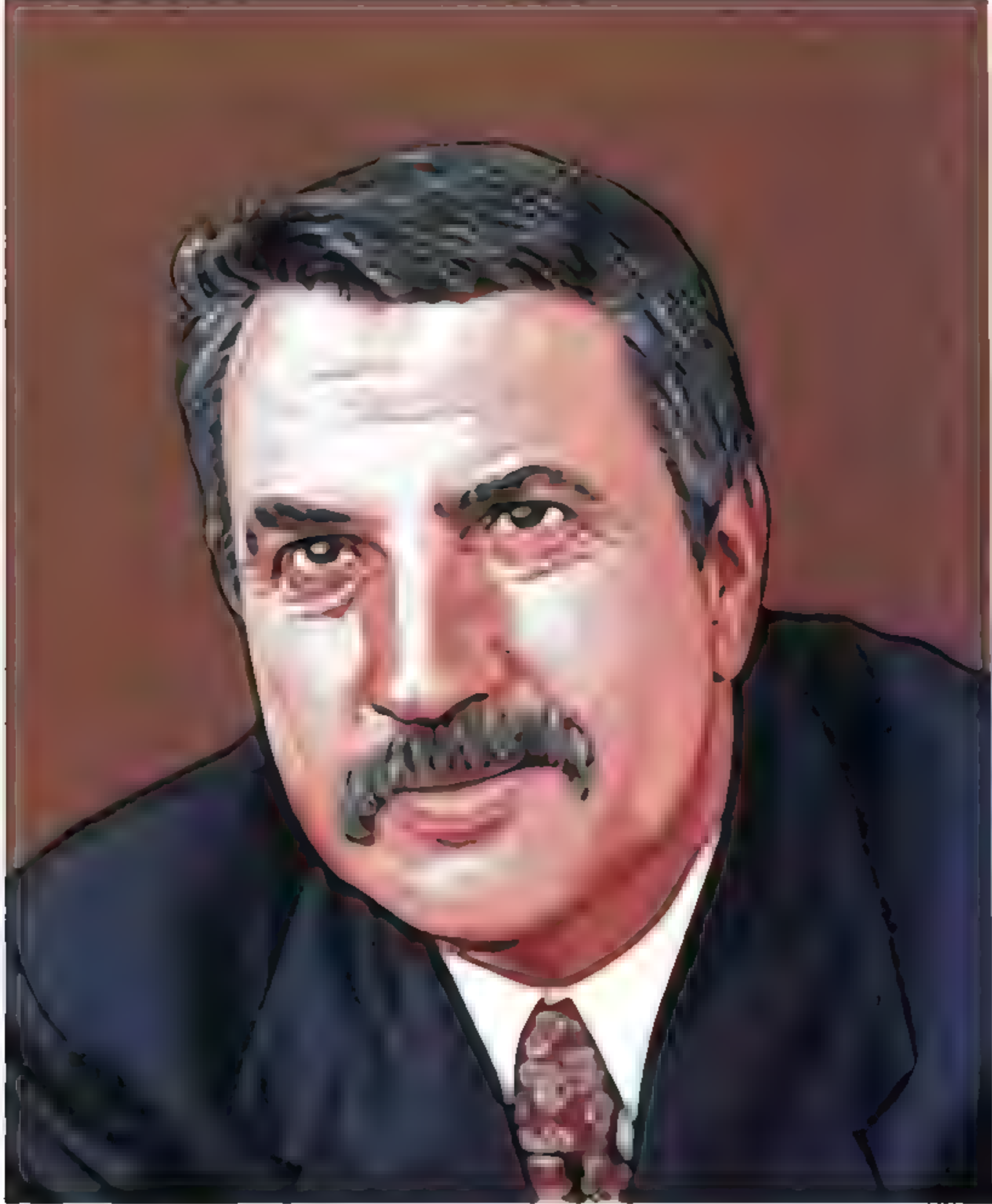
The joint facility will allow films and games, two principal sources of revenue for Lucas, to develop on the same track. ILM effects artists and LucasArts game designers will share a cafeteria, a fitness center, and, most important, a software platform so each company can take advantage of the others' tools. A reengineered gaming engine, for instance, can be a real-time visualization tool for directors on set, while a game developer might use a film lighting technique to add sophisticated illumination to a scene. The two divisions already share enough of the same technology that the assets of the big-screen *Revenge of the Sith* will be incorporated directly into a game version, rather than the film content being used as mere reference material, as was done in the past. "ILM did the effects for the movie *Ali*," says Lucasfilm

CTO Cliff Plamer. "But Microsoft created the game. Now we'll be able to offer clients both services. We'll be an integrated digital entertainment studio." Letterman, in other words, is the physical incarnation of a longtime techno-business trend: the convergence of the movie and gaming industries.

To support all that data exchange, Lucas equipped his new outpost with more than 3,000 processors running 24/7 over a 10-gigabit network that can deliver hundreds of terabytes of data—a factor-of-10 upgrade over the company's existing system. With 1-gig pipes linking every desk to the network, artists don't have to wait for tomorrow's dailies—they can email shots-in-progress to the f/x supervisor for immediate feedback and view hi-def video without leaving their chairs. What's more, they can work independently with large data files containing all of the information about a given scene. Previously, shots had to be broken into small components and spread across several machines. In a business like ours where the margins are extremely low, efficiency is important," says John Knoll, an effects supervisor whose résumé includes the last three *Star Wars* films, *Pirates of the Caribbean*, and, in a previous life, a bit of software called Photoshop. "If you're going to compete with the guys running effects shops out of their garages, you've got to be lean."

Lucas' operation has become soft over the years. His special effects branch once dominated the industry, winning its first Oscar for *Star Wars* in 1977 and 13 more between 1980 and 1994. Though nominated consistently, ILM hasn't won the award since. Today, it's plagued by defections. Many of its stars have decamped (most recently former ILM president Jim Morris to Pixar) for firms like this year's Oscar winner Sony Imageworks and the Orphanage, a boutique house formed by three ILMers in 1999. And then there's the competition from New Zealand and the director of "the other trilogy," Peter Jackson. The lord of the *Rings* saga recently invested \$35 million in a new postproduction site and \$7 million in a soundstage. He also owns a stake in the f/x company Weta Digital, which took home three Oscars for the Tolkien movies.

With Letterman, Lucas hopes to once again become the force for a new generation. ■ ■ ■



WHY THE WORLD IS FLAT

The playing field is being leveled, says globalization guru Thomas Friedman – from Shanghai to Silicon Valley, from al Qaeda to Wal-Mart.

by Daniel H. Pink Illustration by Hiroshi Nagai

Thirty-five years ago this summer, the gofer for Chi Chi Rodríguez was competing in his seventh U.S. Open, played that year at Hazeltine Country Club outside Minneapolis. Tied for second place after the opening round, Rodríguez eventually finished 27th, a few strokes ahead of such golf legends as Jack Nicklaus, Arnold Palmer, and Gary Player. His caddy for the tournament was a 17-year-old local named Tommy Friedman.

Rodríguez retired from golf several years later. But his caddy – now known as Thomas L. Friedman, foreign affairs columnist for *The New York Times* and author of the new book *The World Is Flat: A Brief History of the Twenty-First Century* – has spent his career deploying the skills he used on the golf course: describing the terrain, shouting warnings and encouragement, and whispering in the ears of big players. After 10 years of writing his twice-weekly foreign affairs column, Friedman has become the most influential American newspaper columnist since Walter Lippmann.

One reason for Friedman's influence is that, in the mid-'90s, he staked out the

territory at the intersection of technology, financial markets, and world trade, which the foreign policy establishment still focused on cruise missiles and throw weights, had largely ignored. "This thing called globalization," he says, "can explain more things in more ways than anything else."

Friedman's 1999 book, *The Lexus and the Olive Tree: Understanding Globalization*, provided much of the intellectual framework for the debate. "The first big book on globalization that anybody actually read," as Friedman describes it, helped make him a fixture on the Davos-Avenel Conference-Renaissance weekend circuit. But it also made him a lightning rod. He's been accused of "rhetorical hyperventilation" and dismissed as an "apologist" for global capitalism. The columnists Moynihan even dubbed "opinion society's lack of concern for the downsides of globalization" "the Tom Friedman Problem."

After 9/11, Friedman says, he paid less attention to globalization. He spent the next three years traveling to the Arab and Muslim world trying to get at the roots of the attack on the U.S. His columns on the sub-

ject earned him his third Pulitzer Prize. But Friedman realized that while he was writing about terrorism, he missed an even bigger story: Globalization had gone into overdrive. So in a three-month burst last year, he wrote *The World Is Flat* to explain his updated thinking on the subject.

Friedman enlisted some impressive editorial assistance. Bill Gates spent a day with him to critique the theory. Friedman presented sections of the book to the strategic planning unit at IBM and to Michael De Luca. But his most important editors were two Indians: Nandan Nilekani, CEO of Infosys, and Vivek Paul, a top executive at Wipro. "They were the guys who really cracked the code for me."

Wired sat down with Friedman in his office at the *Times'* Washington bureau to discuss the flattening of the world.

WIRED: What do you mean the world is flat?

FRIEDMAN: I was in India interviewing Nandan Nilekani at Infosys. And he said to me, "Tom, the playing field is being leveled." Indians and Chinese were going

to compete for work like never before, and Americans weren't ready. I kept chewing over that phrase—the playing field is being leveled—and then it hit me: Holy mackerel, the world is becoming flat. Several technological and political forces have converged, and that has produced a global Web-enabled playing field that allows for multiple forms of collaboration without regard to geography or distance or even language.

So, we're talking about globalization enhanced by things like the rise of open source?

This is Globalization 3.0. In Globalization 1.0, which began around 1492, the world went from size large to size medium. In Globalization 2.0, the era that introduced us to multinational companies, it went from size medium to size small. And then around 2000 came Globalization 3.0, in which the world went from being small to tiny. There's a difference between being able to make long-distance phone calls cheaper on the Internet and walking around Riyadh with a PDA where you can have all of Google in your pocket. It's a difference in degree that's so enormous it becomes a difference in kind.

Is that why the Netscape IPO is one of your "10 Flatteners"? Explain.

Three reasons. Netscape brought the Internet alive with the browser. They

overinvested, of a trillion dollars, in fiber-optic cables.

Are you saying the economic consequences trump terrorism? What about September 11? Isn't that as important?

There's no question flattening is more important. I don't think you can understand 9/11 without understanding flattening.

This is probably the first book by a major foreign-affairs thinker that talks about the world-changing effects of supply chains. Laughs!

Why are supply chains so important?

They're incredible flatteners. For UPS to work, they've got to create systems with customs offices around the world. They've got to design supply-chain algorithms so when you take that box to the UPS Store, it gets from that store to its hands and then out. Everything they are doing is taking fat out of the system at every point. I was in India after the nuclear alert of 2002, was interviewing Vivek Patel at Wipro shortly after he'd gotten an email from one of the big American clients saying, "We're now looking for an alternative to you. We don't want to be looking for an alternative to you. You don't want us to be looking for an alternative to you. Do something about this." So I saw the effect that had as being part of this global supply chain had on the behavior



The 10 Great Flatteners

FALL OF THE BERLIN WALL

NETSCAPE IPO

WORK FLOW SOFTWARE

OPEN-SOURCING

OUTSOURCING

OFFSHORING

SUPPLY CHAINING

INSOURCING

IN-FORMING

WIRELESS

"IN IRAQ WE'RE UP AGAINST A SUICIDE SUPPLY CHAIN."

made the Internet so that Grandma could use it and her grandchildren could use it. The second thing that Netscape did was commercialize a set of open transmission protocols so that no company could own the Net. And the third is that Netscape triggered the dotcom boom, which triggered the dotcom bubble, which triggered the

of the Indian business community, which eventually filtered up to New Delhi.

And that's how you went from your McDonald's Theory of Conflict Prevention—two countries that have a McDonald's won't go to war with each other—to the De Theory of Conflict Prevention: Yes, No two countries that are both part

of a major global supply chain like Dell is
wrestling against each other as long as
they are both part of that supply chain.
When I'm managing your back room when
I'm managing your HR, when I'm doing
your accounting, this is way beyond seeing
you burgers. We are intimately in bed
with each other. And that has got to affect
my behavior.

In some sense, then, the world is a gigantic supply
chain. And you don't want to be the one who brings
the whole thing down.
Absolutely.

Unless your goal is to bring the whole thing
down. Supply chains work for al Qaeda, too,
don't they?

Al Qaeda is nothing more than a mutant
supply chain. They're playing off the same
platform as Wal-Mart and Dell. They're just
not rostrated by it. What's al Qaeda? It's
an open source religious political movement
that works off the global supply chain.
That's what we're up against in Iraq. We're
up against a suicide supply chain. You take
one bomber and deploy him in Baghdad
and another is manufactured in Riyadh the
next day. It's exactly like when you take the
toy off the shelf at Wal-Mart and another
is made in Shen Zhen the next day.

The book is a messily optimistic about India
and China, about what flattening will bring to these
parts of the world.

I firmly believe that the next great break-
through in bioscience could come from
a 15-year-old who downloads the human
genome in Egypt. Bill Gates has a niece there.
He says, 20 years ago, would you rather
have been a B-student in Poughkeepsie
or a genius in Shanghai? Twenty years
ago you'd rather be a B-student in Poughkeepsie.
Today?

Not even close.

Not even close. You'd much prefer to be the
genius in Shanghai because you can now
export your talents anywhere in the world.

As optimistic as you are about that kid in Shanghai,
you're not particularly optimistic about the U.S.

Contributing editor Denise H. Pink (www.danpink.com) also writes about the rise of
homegrown solar power on page 168.

I'm worried about my country. I love Amer-
ica, I think it's the best country in the world.
But I also think we're not tending to our
sauce. I believe that we are in what Shirley
Ann Jackson (president of Rensselaer Poly-
technic Institute) calls a "quiet crisis." If we
don't change course now and buckle down

You call for portable benefits, lifelong learning,
free trade, greater investment in science, govern-
ment funding for tertiary education, a system of
wage insurance. Uh, Mr. Friedman, are you running
for president?

Laughs loudly. No, I am not running
for president.

“FINISH YOUR HOMEWORK. PEOPLE IN CHINA ARE STARVING FOR YOUR JOB.”

In a flat world, the kind of competition our
kids will face will be intense and the social
implications of not repairing things will
be enormous.

You quote a CEO who says that Americans have
grown addicted to their high salaries, and now
they're going to have to earn them. Are Americans
suffering from an undue sense of entitlement?
Somebody said to me the other day that
I wish I had this for the book, but it's going
to be in the paperback—the entitlement we
need to get rid of is our sense of entitlement.

Let's talk about the critics of globalization. You say
that you don't want the antiglobalization movement
to go away. Why?

I've been a critic of the antiglobalization
movement, and they've been a critic of me,
but the one thing I respect about the move-
ment is their authentic energy. These are
not people who don't care about the world.
But if you want to direct your energy toward
helping the poor, I believe the best way is
not throwing a stone through a McDonald's
window or protesting World Bank meet-
ings through local governance. When you
start to improve local governance, you
improve education, women's rights, trans-
portation.

It's possible to go through your book and conclude
it was written by a U.S. senator who wants to run for
president. There's a political agenda in this book.
Yes, absolutely.

Would you accept the vice presidential
nomination?

I just want to get my Thursday column done.

But you are outlining an explicit agenda.

You can't be a citizen of this country and
not be in a harrowing rage at the fact
that we're at this inflection moment and
nobody seems to be talking about the
kind of policies we need to get through
this flattening of the world. To get the most
out of it and cash on the worst. We need
to have as focused, as serious, as energetic
as sacrificing a strategy for dealing with
flatism as we did for communism. This is
the challenge of our day.

Short of Washington fully embracing the
Friedman doctrine, what should we be doing?
For instance, what advice should we give
to our kids?

When I was growing up, my parents told
me, "Finish your dinner. People in China
and India are starving." To my daughters,
"Finish your homework. People in India and
China are starving for your job."

Think about your own childhood for a moment.
If a teenage Tommy Friedman could somehow
have been transported to 2005, what do you think
he would have found most surprising?

That you could go to PGA.com and
get the scores of your favorite golfer
in real time. That would have been
amazing. ■ ■ ■



P0033 - Chicago & Human (Zone 10)

P0032 - Lexington &

SPYCAM FORCE

CHICAGO'S TWO-FISTED STREET COPS HAVE A NEW KIND
OF BACKUP: A POINT-AND-CLICK SURVEILLANCE
NETWORK TIED TO A CITYWIDE CRIME-FIGHTING DATABASE.
(SMILE FOR THE CAMERA.)

BY NOAH SHACHTMAN PHOTOGRAPHS BY ED KASH

ON A WARM AFTERNOON

the wall of the One Stop Food and liquor store at the corner of Chi-

ing dope - you can tell a checker

ry's murder capital

the screen

enforcement

Officer David Rasmussen

of Chicago before he went to work for Huberman. Today he's and

1995 for heroin, D.U.s, sex abuse, murder. We know all that because
of a network of databases called Clear - "Citizen Law Enforcement"

living

says, "We can tell who you are

of the station houses and at police headquarters. The database has

send troops

the system's list

On his PC, Keating calls up Clear and shows me his findings

"We sit to eight months to develop a set of evidence in your district and we had to rely on the detectives to put together the picture. Keeping eyes wide open, wide open, wide open, and we have it all citywide. The 25th is going to come with a half dozen blue guns, six black rounds and two orange capsules. Soaking round one in the game to get me a Kevlar vest; we're going to the 25th tonight."

Sitting NEXT TO ME in the back of a pickup truck heading down North Redondo, Officer Danielo Tello — also given by Nicky — is hoping, hoping, for someone to do something wrong and give her a little action. "We're not here breaking, beating or harassing," she says, adjusting her red pointed-toe boots by past the Transit Earth Avenue Hair Braiding Salon and the Baby Cakes store. Forty Dollars with deep discounts and a devilish smile, has the wheel. They are going to take down the Red Rapist again. Another officer, Ricardo Bracamontes, rides copilot.

When I tell them I'm writing a story about police technology, the Department's first "OK rock" reply says, "we've been advancing." Cicerio says, sure. "If you're back in the station house right now, only about 50 years have gone by, and this last one of them. That's about to change when Verizon switches over to high-speed cellular network, unleashing enough bandwidth to connect thousands more. Meanwhile, the Panasonic Toughbook laptop mounted in hermetically-sealed fireproof safe (and that I would check on Windows 2.1.3) takes only a couple of hours out of patrol on one day's duty. One need an upgrade.

1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2208, 2209, 2210, 2211, 2212, 2213, 2214, 2215, 2216, 2217, 2218, 2219, 2220, 2221, 2222, 2223, 2224, 2225, 2226, 2227, 2228, 2229, 2230, 2231, 2232, 2233, 2234, 2235, 2236, 2237, 2238, 2239, 2240, 2241, 2242, 2243, 2244, 2245, 2246, 2247, 2248, 2249, 2250, 2251, 2252, 2253, 2254, 2255, 2256, 2257, 2258, 2259, 2260, 2261, 2262, 2263, 2264, 2265, 2266, 2267, 2268, 2269, 2270, 2271, 2272, 2273, 2274, 2275, 2276, 2277, 2278, 2279, 2280, 2281, 2282, 2283, 2284, 2285, 2286, 2287, 2288, 2289, 2290, 2291, 2292, 2293, 2294, 2295, 2296, 2297, 2298, 2299, 2300, 2301, 2302, 2303, 2304, 2305, 2306, 2307, 2308, 2309, 2310, 2311, 2312, 2313, 2314, 2315, 2316, 2317, 2318, 2319, 2320, 2321, 2322, 2323, 2324, 2325, 2326, 2327, 2328, 2329, 2330, 2331, 2332, 2333, 2334, 2335, 2336, 2337, 2338, 2339, 2340, 2341, 2342, 2343, 2344, 2345, 2346, 2347, 2348, 2349, 2350, 2351, 2352, 2353, 2354, 2355, 2356, 2357, 2358, 2359, 2360, 2361, 2362, 2363, 2364, 2365, 2366, 2367, 2368, 2369, 2370, 2371, 2372, 2373, 2374, 2375, 2376, 2377, 2378, 2379, 2380, 2381, 2382, 2383, 2384, 2385, 2386, 2387, 2388, 2389, 2390, 2391, 2392, 2393, 2394, 2395, 2396, 2397, 2398, 2399, 2400, 2401, 2402, 2403, 2404, 2405, 2406, 2407, 2408, 2409, 2410, 2411, 2412, 2413, 2414, 2415, 2416, 2417, 2418, 2419, 2420, 2421, 2422, 2423, 2424, 2425, 2426, 2427, 2428, 2429, 2430, 2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438, 2439, 2440, 2441, 2442, 2443, 2444, 2445, 2446, 2447, 2448, 2449, 2450, 2451, 2452, 2453, 2454, 2455, 2456, 2457, 2458, 2459, 2460, 2461, 2462, 2463, 2464, 2465, 2466, 2467, 2468, 2469, 2470, 2471, 2472, 2473, 2474, 2475, 2476, 2477, 2478, 2479, 2480, 2481, 2482, 2483, 2484, 2485, 2486, 2487, 2488, 2489, 2490, 2491, 2492, 2493, 2494, 2495, 2496, 2497, 2498, 2499, 2500, 2501, 2502, 2503, 2504, 2505, 2506, 2507, 2508, 2509, 2510, 2511, 2512, 2513, 2514, 2515, 2516, 2517, 2518, 2519, 2520, 2521, 2522, 2523, 2524, 2525, 2526, 2527, 2528, 2529, 2530, 2531, 2532, 2533, 2534, 2535, 2536, 2537, 2538, 2539, 2540, 2541, 2542, 2543, 2544, 2545, 2546, 2547, 2548, 2549, 2550, 2551, 2552, 2553, 2554, 2555, 2556, 2557, 2558, 2559, 2560, 2561, 2562, 2563, 2564, 2565, 2566, 2567, 2568, 2569, 2570, 2571, 2572, 2573, 2574, 2575, 2576, 2577, 2578, 2579, 2580, 2581, 2582, 2583, 2584, 2585, 2586, 2587, 2588, 2589, 2590, 2591, 2592, 2593, 2594, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2610, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2627, 2628, 2629, 2630, 2631, 2632, 2633, 2634, 2635, 2636, 2637, 2638, 2639, 2640, 2641, 2642, 2643, 2644, 2645, 2646, 2647, 2648, 2649, 2650, 2651, 2652, 2653, 2654, 2655, 2656, 2657, 2658, 2659, 2660, 2661, 2662, 2663, 2664, 2665, 2666, 2667, 2668, 2669, 2670, 2671, 2672, 2673, 2674, 2675, 2676, 2677, 2678, 2679, 2680, 26

THE MAP ON HIS SCREEN
IS DOTTED WITH ICONS:
6 BLUE GUNS, 6 BLACK
MASKS, 2 ORANGE CORPSES

DeLise screams as Phil hustles back into the car.

Microphones hit the lights. Street lights. Crying pain in 800° Celsius under the white heat of the light, smoldering and thumping into E.D. The radio says to be on the lookout for a suspected green hospital, headed north. Is they all Clinton Avenue, they run for valid. Oh, maybe. But it's going north. And it's gone, not green. If they had Clinton in their sight, but they might have been able to get updates on the hospital's location. But for the plane. Because once you find it's for moving one, but Malin's follows, anyway carrying "Maver" she yells to go to Malin's wherever he lives of us. "We moved for you all the time! Now get out of our way!"

The suspect, a 26-year-old, was heading west on Chicago Avenue, a half dozen other police cars have joined the chase and they 171

THE CLEAR WAY TO FIGHT CRIME



REFLECTIONS

Chicago's police received 107 911 calls during 1997, but are expected to receive only 7,000 calls with non-emergency numbers in 1998. It is not expected to respond to 811 calls.



ANALYZE

This year, we've
seen well as 800,000
dollars in donations that
represent a 10 percent
increase over the
previous year. And
we're still updating



423125

The same hands that
control the nation's
land, sea and air
patrols, so police
know where to deploy
members of the
United States Coast Guard.



Analysis and Reporting under



THE NEW POWER GENERATION

Soccer moms, taco shops, even real estate developers — mainstream America is starting to pull the plug and rely on homegrown solar

energy. Call it the power of the home.

BY DANIEL H. PINK / PHOTOGRAPHS BY BAERBEL SCHMIDT

In the old days, being green meant being hardcore. Earnest enviros plugged their poky electric cars into the wall like four-wheeled toaster ovens. They bought organic food at dusty co-ops staffed by vegan clerks in hemp ponchos. And if they were really serious, they disconnected from planet-ravaging modernity altogether and lived in a creaky cabin off the grid.

Today, hardcore has given way to hybrid. Soccer moms too, around in the Toyota Prius, with its puffy gas-electric engine that saves both fossil fuel and family funds. The suburbs are stuffed with flexitarians — mostly veggies who pack up their staples from the gleaming organic produce section at the local Whole Foods but also opt for an occasional free-range chicken breast.

Now come the first stirrings of what may be the most telling sign of this shift from

hardcore to hybrid, people who are both middle of the road and off the grid. Across the US some 185,000 households have switched from the local power company to their own homegrown, renewable energy. The fastest-growing segment of this population — their ranks are doubling each year — isn't doing a full Kaczynski. Sure these folks are slapping solar panels on the roof and erecting the occasional wind turbine, but they're staying connected to the grid, just to be safe. And in many cases they're operating as mini-utilities, selling excess electricity back to the power company. Just as their cars aren't kludgy and their food isn't flavorless, their homes aren't drafty or dimly lit. Call them hybriders. And look for them soon in a neighborhood near you. Because ironclad rule: take note — hybrid is the new Prius.

Three hours northwest of Indianapolis, plopped in the middle of an ocean of corn fields, sits the unincorporated village of Stelle, Illinois, population 110. Steve and Jan Bell make their home here, on Tamarind Court, in an ordinary house with blue siding, a tidy front yard, and an attached garage. There's a 32-inch Sony in the rec room, family photos in the living room, a Kitchen Aid double oven and a hoity Amana refrigerator. Steve, a 52-year-old former firefighter with flaming reddish-blond hair and a neatly trimmed beard, rounds out the picture of Midwestern normalcy. The Sunday afternoon that we meet he's wearing jeans and a flannel patterned shirt — just a regular middle-class guy spending the weekend helping a friend move, mowing the lawn, and tuckering in his basement.

In the backyard, the scene is topsy-turvy. Standing 11.5 feet tall, a wind turbine-galops out on the surrounding cornfields. Next to it is a 14-foot solar tracker. 880 watts' worth of photovoltaic panels that follow the sun atop a swivel-pole. There are 28 more panels on the roof. All this feeds into a basement power plant. The all-energy-control center features an inverter, about the size of a PC tower, that converts sun and wind energy into AC current to run the lights and appliances. A bank of 24 batteries each about 180 pounds, store the electricity for later use.

On cloudy or windless days the Bells rely on the batteries and then, when they run dry, draw juice from the Commonwealth Edison grid. But when the wind blows or the sun shines, their homegrown energy powers the house. And if their turbine and solar panels are producing more electricity than they need or can store in their battery bank, the couple sells the excess to ConEd.

The Bells prefer to live autonomously. They heat their home with a wood-burning stove. Their hot water dryer, and stove use liquid propane. When I ask about their energy costs, Steve grabs some old electric bills and a pocket calculator and we take a seat at the dining room table.

In the last year, he figures, he purchased about 4,400 kilowatt-hours of electricity and sold back about 2,400 kilowatt-hours. For approximately five months in 2004 his electricity bill was zero. He pecks at the calculator to add the heating expenses, then taps a few more keys and scribbles a figure on his notepad. Last year, the total cost of electricity and gas to run this perfectly ordinary, perfectly comfortable 2,200 square-foot home was \$340. The typical American household spends about \$1,400 annually on heat and electric utilities. But by living neither totally on the grid nor totally off it, the Bells met all their heating and electricity needs for a full year for about the price of an iPod.

Hybridizing electricity is one of those things that homeowners scarcely think about. Each time you flick a light switch or turn on a coffee maker your meter creeps forward a bit registering the inflow of energy and charging you for it. But the sun is shining on Maplewood Court this afternoon so I'm stashed in the bushes outside Robert Canney's ranch house to watch his Westinghouse meter perform a little hybrid magic.

Canney, who lives with his wife, Amy Hanger, outside the nation's capital in Greenbelt, Maryland, has 48 solar panels on his roof and a grid-tied inverter in the basement. On this sunny, temperate day, the Canneys are producing more electricity than their home uses; they've already topped off their batteries. When I first begin staring at their meter, the dial think of it as an electricity odometer reads 4,551 kilowatt-hours. Then the silver platter in the center of the device begins slowly spinning from right to left, instead of its usual, left-to-right course. Three minutes later, the dial clicks. Presto: 4,560 kilowatt-hours. Welcome to the Canney Utility Company.

What's going on in Greenbelt could soon be unfolding in suburbs across America. A combination of forces is pushing hybridizing into the mainstream. Start with the cost of energy. Most US homes use natural gas for heat. Natural gas prices have been soaring. So has the price of electricity produced by coal-burning power plants. And that's not even factoring in the more than \$1 billion in subsidies that go to the oil and gas industry, for the environmental damage increased greenhouse emissions and mercury pollution—caused by burning fossil fuels.

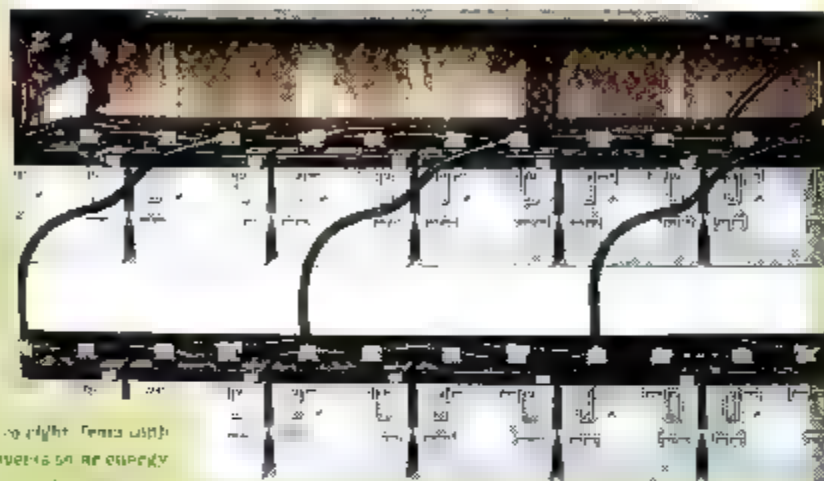
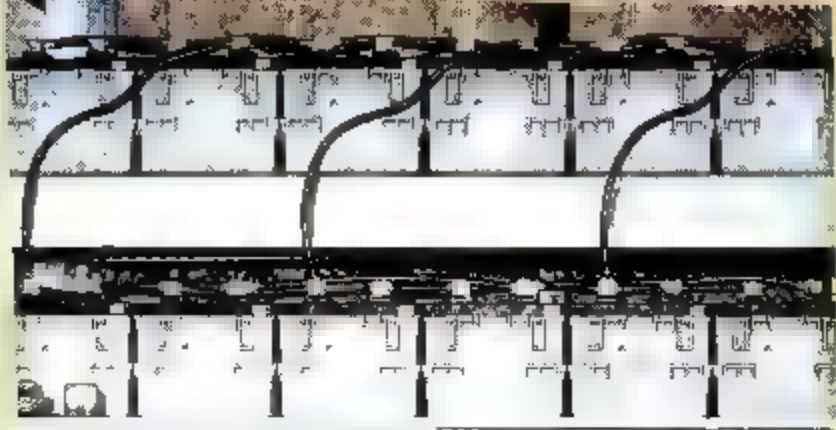
At the same time, the conventional power grid is showing signs of age. Energy use has increased far more quickly than capacity has been added. So blackouts and brownouts occur more often. According to Jay Apt, director of the Electricity Industry Center at Carnegie Mellon University, every four months the US endures a blackout large

enough to cut power to half a million homes. And the threat of terrorism, and homeowners understandably want greater security and control over their power. "I'd rather do it myself than trust the experts," Bell says. When the grid goes down, his lights stay on.

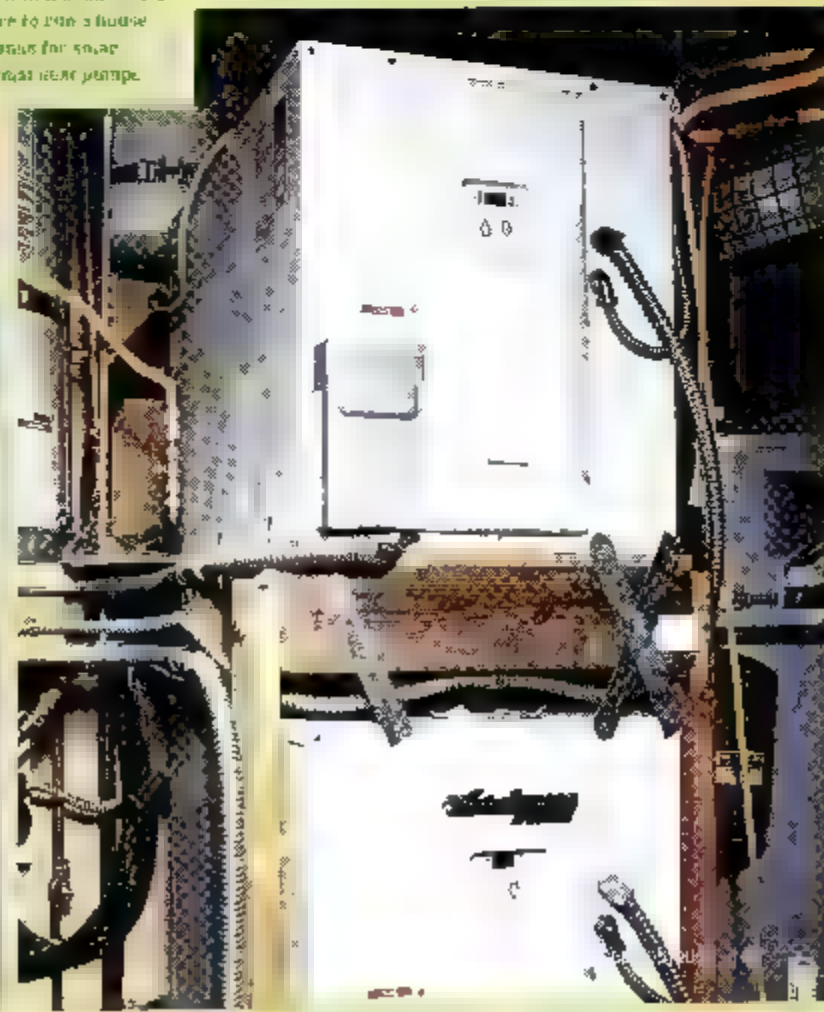
Of course, alternative energy has been the next big thing for the past 40 years. But solar power has never been able to shake a couple of problems. First, converting the sun's light energy is expensive. As recently as 1980, the cost of using photovoltaic panels to turn sunlight into electricity was \$1 per kilowatt-hour. By 1996 that figure had fallen by two-thirds to 33 cents. But that was still more than eight times the cost of using coal. Only a handful of hardcore greens were willing to multiply their energy bills by eight to save the planet. Thanks to advances in technology and changes in public policy over the past 10 years, however, the cost of solar has nearly halved again and continues to fall, according to the US National Renewable Energy Laboratory. Solar thermal—using sun energy to heat water—now costs in the range of 6.5 cents per kilowatt-hour, one-tenth of its price 25 years ago. And more progress appears to be on the way. Several companies are using nanotechnology to develop solar cells the thickness of Saran Wrap that are even more efficient, easier to install on roofs, and cheaper to produce. Still, going hybrid remains a comparatively pricey proposition. Bell spent more than \$15,000 on his solar modules, almost the same amount for the rest of the system, including the wind turbine, plus \$1,000 for two inverters. But several states have stepped in to subsidize homeowners who want to deploy renewable energy. For instance, Illinois cut the Bells a \$12,800 check. The Canneys bought \$12,000 worth of solar panels but paid only \$8,500 after a rebate from the state.

Dan Snierson www.danepink.com is a Wired contributing editor.

**CLEAN, LOW-HASSLE
GREEN ENERGY IS - FINALLY -
BECOMING PRACTICAL.**



The key to power (left to right) lies with an inverter which converts solar energy into AC, battery charge controller, panel, a solar panel array, solar enough power to run a house or, solar days, storage tanks for solar-powered water, go through solar pump.





"IF I CAN GROW TOMATOES IN MY BACKYARD, I CAN GROW ELECTRICITY ON MY ROOF."

of Virginia, where the panels were manufactured. And the state of Maryland gave them a \$3,800 grant, plus a 15 percent tax refund. All this brought the actual cost down to \$3,625. At that price, their hybrid system will pay for itself in reduced utility bills in six years. Meantime, New Jersey subsidizes up to 70 percent of the cost of a new home solar system. Massachusetts and New York offer substantial rebates. California governor Arnold Schwarzenegger recently proposed additional subsidies and tax credits to cover a million California rooftops with solar panels.

San power, of course, has a more fundamental disadvantage. It's called nighttime. The modern world may depend on power 24/7, but the sun operates on its own schedule. So to make this option truly viable, homeowners need to store the energy made while the sun is shining. Until recently the only storage receptacles were batteries like the ones Steve Bell has in his basement. In general, these units cost a lot and store only a little. Bell's bank of 24 batteries, for instance, could power his house for just five to six days.

However, the grid itself is in many ways a gigantic battery. If homeowners could fill up their individual batteries and feed the surplus back to the grid, they wouldn't waste their excess energy and they'd even help reduce demand on the grid. Transmitting power from a home source to the grid this way wasn't legal in many states and, sadly, not today. But today 37 states have laws or provisions for "net metering." And the grid-tied inverters that enable the process—hard to find only a handful of years ago—have become widely available.

Now if hybridizers produce more energy than they can use or store, local utilities are required to buy it from them and credit their electric bills. This has created a growing network of mini power plants that supply renewable energy to their less environmentally enlightened neighbors. "If I can grow tomatoes in my backyard," says Richard Peres, publisher of *Home Power* magazine,

"I can now grow electricity on my roof."

Of course, it's still much easier to buy a hybrid car than to outfit a hybrid home. Steve Bell is a self-described tinkerer who found configuring his home so interesting that he went to work for a solar company. Robert Canaday is no eco-slouch either: he works at Goddard Space Flight Center. But as word spreads, technology improves, and costs drop, hybrid power, like the hybrid car, will become another form of low-hassle environmentalism that lets people have their eco-cake and eat it, too.

It's lunchtime on Belmont Avenue, a bustling artery of laundromats, used-car dealerships, and Polish-American video stores that runs through the heart of a working-class, multiethnic neighborhood on Chicago's west side. A crowd files into the Taco Burrito King, where a cashier takes orders in English and Spanish and a cook chops chicken and onions that will eventually make their way into burritos. It could be just another Monday lunch rush at any one of hundreds of Windy City taquerias—except for what's happening on the roof. Up there, smiling southward into the noonday sun, are nine giant solar panels.

Salvador Lamas wears the crown of the Taco Burrito King, a chain of five restaurants. His motivation for going solar is simple: He was paying through the nose to heat 800 gallons of water every day. So he dropped \$30,000 on a local contractor called Solar Service, received a \$5,000 rebate from Illinois' renewable energy fund, and installed the panels on the roof of his Belmont Avenue building, the newest restaurant in the chain.

Lamas now saves money by heating water directly with solar thermal. He also saves indirectly, by consolidating the prep work for the entire chain—washing and cooking vegetables, for example—where the energy comes cheapest. As a result, he saves close to \$2,000 a month. At that rate, his investment will pay for itself in less than five years. "It's good for everybody," he says.

"And... can actually make you money."

That's why real estate developers—not exactly your classic tree-huggers—have begun building solar-powered hybrid developments in Arizona, California, and Virginia. It's why the amount of captured solar energy is expected to nearly quadruple by 2010, as baby boom renovators look for easy, cost-effective ways to go green without going crazy. It's why architects such as Noel Cross, who lives in San Jose, California, in a breathtaking hybrid home he designed himself, are turning their attention to this area. "The stuff that came out the 60s and '70s was little hippie shacks," he says. "I want to build beautiful buildings."

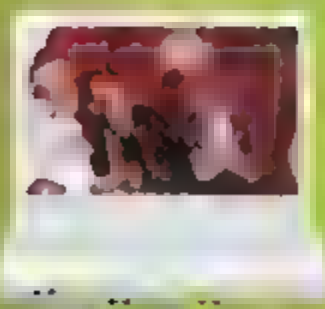
Today's standard mode of creating energy—burning carbon and distributing it over long distances—requires a massive infrastructure and triggers what economists call externalities (and the rest of us call pollution). Yet while power generation has remained largely centralized, much of the rest of society has become decentralized—sometimes radically so. Think peer-to-peer networks, open source, and, of course, the Internet.

The US derives less than 2 percent of its energy from solar and wind power. Hybridizers will nudge that figure upward, and, in doing so, will further decentralize power (both electric and political) in the US. After all, sunlight is free. It doesn't pollute. It has no need for armies to protect it or pipelines to distribute it. And enough of it falls on Earth each hour to meet the world's energy demands for one year. Clean, free, plentiful, and finally practical. Not bad for an energy source.

The hybrid movement has the makings of something big—the sort of market revolution that's born of a confluence of timing, technology, and politics—and is led by a few path-clearing pioneers. "Other energy once you use it's gone. The sun is always there," Lamas says. "If we don't use it, shame on us." In hybrid times, perhaps we can all live like the Taco King. ■ ■ ■

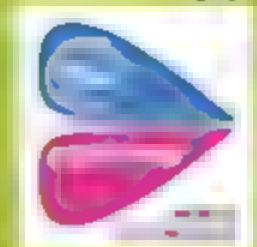


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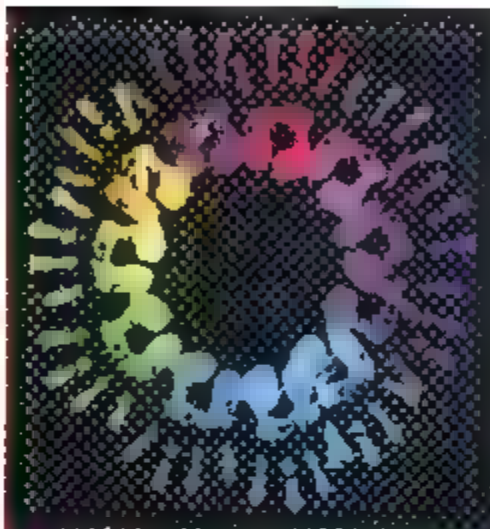
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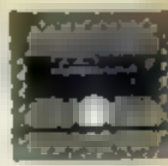
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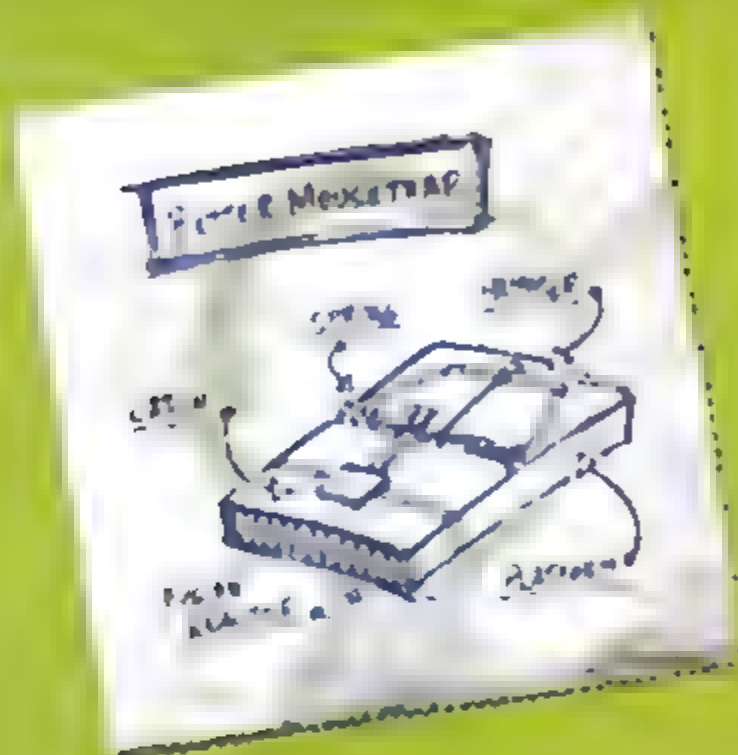


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•157 pin the Intrepid in at Kilbourn Avenue. Officers pile out, guns drawn. For a moment everything is quiet. If there were a pod camera nearby, the cops back in Huberman's headquarters could get a look at the man behind the wheel, or run the license plate number. But there isn't. "I knew this wasn't it," Bracamontes mutters.

But then the Intrepid takes off, plowing over an officer and, we hear later, snapping his leg. Two blocks further on, in front of a town house, we come upon the Intrepid, empty. He's on the run, but the place is already swarming with badges. The Stepsisters take that as their cue to leave. When they get Clear in their car, they'll be able to submit paperwork on the chase and the rundown from their laptop - but if they stay tonight, they'll spend the rest of the shift at the station house, filing out reports.

Not that they manage to avoid some paperwork. In the 26th District's dingy fluorescent

a kind of epiphany. All of the department's district houses had already been linked in a 500-mile fiber-optic network, thanks to 1980s and 1990s investments. New York was already making statistics-based policing famous with its CompStat system. But in New York, information flowed only one way up to the chiefs and the crime analysts, who then ran the numbers and sent reports and data out to the rest of the city. Huberman believed that fiber could help the police figure out who the real crooks were. Information could gush in every direction, linking systems from investigations to evidence tracking to personnel management to community involvement. Oracle bought into the idea, contributing \$20 million in time, software and hardware. The eventual result was Clear.

In 2003, Huberman - by then an assistant deputy superintendent - started Operation Disruption, a pilot program to string 30 surveillance cameras along the West Side. The idea was simply to put the silent sentries up on telephone poles, to let the bad guys

Nearly 300 local law enforcement agencies in 36 Illinois counties have tapped into Clear. So have agents from the FBI, Secret Service, and the Bureau of Alcohol, Tobacco, and Firearms. Officials from the LAPD have been to Chicago to study the system; the mayor of San Francisco cited Chicago when he touted networked surveillance cameras for his city's most dangerous neighborhoods. In Washington, D.C., police department tech czar Phil Graham is designing a regional data hub that he says is "absolutely inspired by Clear."

All that support has fueled Huberman's next big idea: Expand the panopticon even further, to include more than 2,000 private and public surveillance cameras around Chicago. Huberman has snared \$34 million from the Department of Homeland Security and another \$5 million from the city to put 250 more cameras downtown and link them to Chicago's emergency center through the city's fiber backbone.

In other surveillance cities like London,

THE COP TRIES TO TYPE IN HIS REPORT. "HEY," HE WHISPERS, "GOT ANY PAPER?"

lit station house, Bracamontes uses two fingers to try to enter an arrest report into Clear. He can't quite swing it. "Hey, man," he says in a half-whisper to another cop, "got any paper?"

Clear was born out of anger and frustration. Chicago had been trying to upgrade its computer network for most of the 1990s, in third fits and starts. A 1999 rollout of an automated case reporting application went so badly that a detectives newsletter warned the IT guys to watch their backs on the street. So the CPD decided to start from scratch with a database for arrest reports and case histories. As the system began to take shape in 2000, Ron Huberman returned to the department from a stint with a think tank in Washington, D.C. Just 28 years old, with a crew cut and cordwood arms, he had already spent four years as a beat cop and gang specialist in Rogers Park, working nights while studying for dual master's degrees - in business administration and public policy - during the day. Coming back to Chicago, Huberman had

known they weren't invisible anymore. During its first seven months, drug-related calls to the police in those neighborhoods went down 76 percent; serious crimes dropped by 17 percent. It's hard to tie correlation to cause, but the broad antichime strategy - surveillance cameras, real-time data updates and smarter deployment of tactical police units - seems to have helped bring down the body count. The city had 445 killings last year, a 26 percent drop from 2003. "This is about restoring a sense of order about taking streets from the gangbangers," Huberman says.

Police departments often tout the latest toys and gadgets as the way to win the war on crime. Usually these programs are tepid solutions to systemic problems. Or they're great ideas too narrowly deployed. But what's happening in Chicago is different. No police force this size has ever gone this digital. No major department has ever connected so many street cops to so much information, or backed them up with a vast network of cameras.

Now the Chicago model is spreading

squads of monitor jockeys have to make sense of confusing overlapping video feeds. Huberman plans to make all that observation more focused. Every day his 911 emergency hotline gets 18,000 calls; once the cameras get linked, every 911 call will turn on the nearest camera, showing dispatchers the scene in real time.

Funded with \$3.5 million from local drug busts, the next wave of pod cameras will have audio sensors that listen for gunshots (and distinguish between them and similar noises, like the pop of a firecracker). Software will scan the video feeds for suspicious behavior. Come too close to a restricted government building, leave a package on an El platform or even hang out for too long on a ghetto street corner and smile: you're on Criminal Camera.

All this technology has some longtime Chicago community activists squirming. History has provided several reasons to mistrust the police. Former Chicago mayor Richard J. Daley's notorious Red Squad snooped on such groups as the

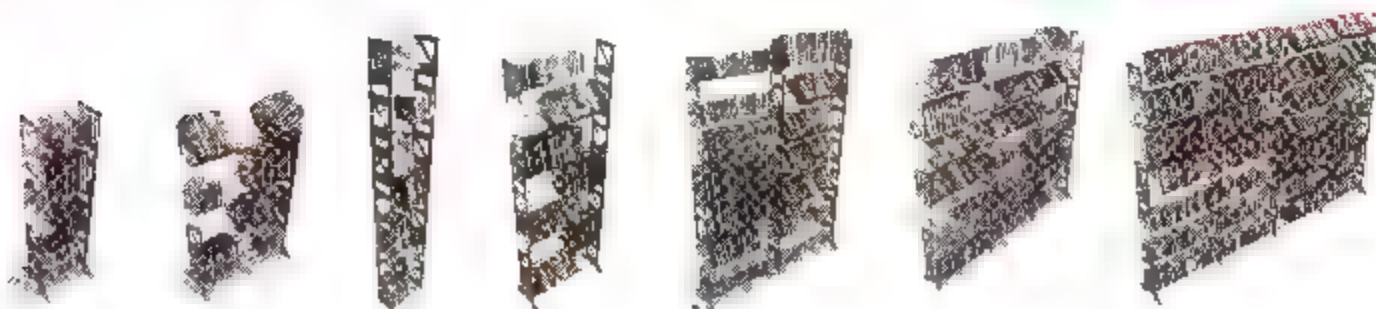
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League of Women Voters and the American Jewish Congress, and kept files on 200,000 Chicagoans. The unit was officially disbanded in 1981, but in 2002, the police infiltrated five antiglobalization protest groups and then undertook four more unspecified spying operations a year later, according to the *Chicago Tribune*. Reports of corruption on the force are still all too common. "It's almost inevitable considering the nature of the Chicago police, that we're going to hear about abuses regarding this technology," says Representative Bobby Rush, a former Black Panther who has represented the South Side in Congress for 13 years.

For years, the CPD's solution to street crime was to clear the sidewalks. A controversial 1992 anti loitering law allowed police to arrest entire groups of people if just one of them was a known gang member. The US Supreme Court struck down the law in 1999 as a violation of the right to free assembly. Critics worry that the cameras and tactical units are more of the same—and see in other class evidence to support their fears. In New Orleans, for

instance, surveillance cameras were originally envisioned as witnesses that couldn't be intimidated. The problem, critics say, is that the cameras make the streets so unfriendly that no one feels comfortable leaving the house, whether they're planning to break the law or not. One inarguable effect, says NOPD detective Mike Caranbat: "You put one of these cameras up and those thugs, they scatter like roaches in the spotlight."

Critics also note that surveillance cameras seem to get pointed at certain minority groups. One Hull University study found that nine out of ten targeted surveillances were on men, particularly if they were young and black. Another discovered that blacks were twice as likely as whites to be surveilled for no apparent reason. Paul Jakes Jr., a reverend whose Old Saint Paul, Missionary Baptist Church is not far from where Chicago's first surveillance camera was mounted, says the pods are another way to turn his neighbors into suspects. "They have criminalized the whole community," thunders Jakes, who ran for mayor in 2003, partially on a platform of keeping the cops in check.

Yet not every community leader agrees with Rush and Jakes. "People are asking for

these cameras; there's not enough to go around," says Ed Smith, an alderman on the West Side. "Look, I'd love to live in a community filled with elegance, opulence and complete serenity. But that's not the case. So we have to do what we have to do in order to keep our citizens safe."

That's pretty much the city hall line too. Richard M. Daley, who won a fifth term in 2003 by defeating Jakes with 79 percent of the vote, had a simple, unapologetic message when he introduced the gunshot-sensing cameras last year: He stood up at a press conference and said, "We own the street."

Back in the Emergency Management Center, Sergeant Greg Hoffman is watching a pair of suspicious fortysomethings on a 10-foot wall of video monitors. From a half-block away, the sergeant sees one deal go down. And then another. "Maybe they really need the money," Hoffman later muses. "Maybe they think that we can't see from this far away. Whatever. He calls in a local antidrug team, which recovers 14 tiny tin foil packets of heroin. "When we looked 'em up," Hoffman says, "we told 'em, 'We can see you. We are watching. Let 'em people know.'"



Return to Sender

The Wired "Return to Sender" Contest
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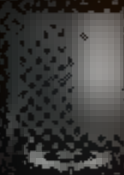
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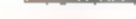
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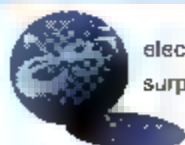
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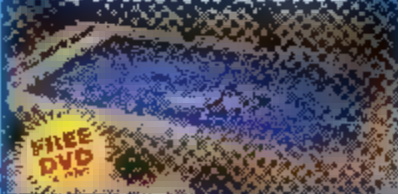
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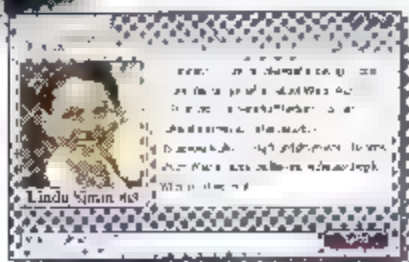
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